



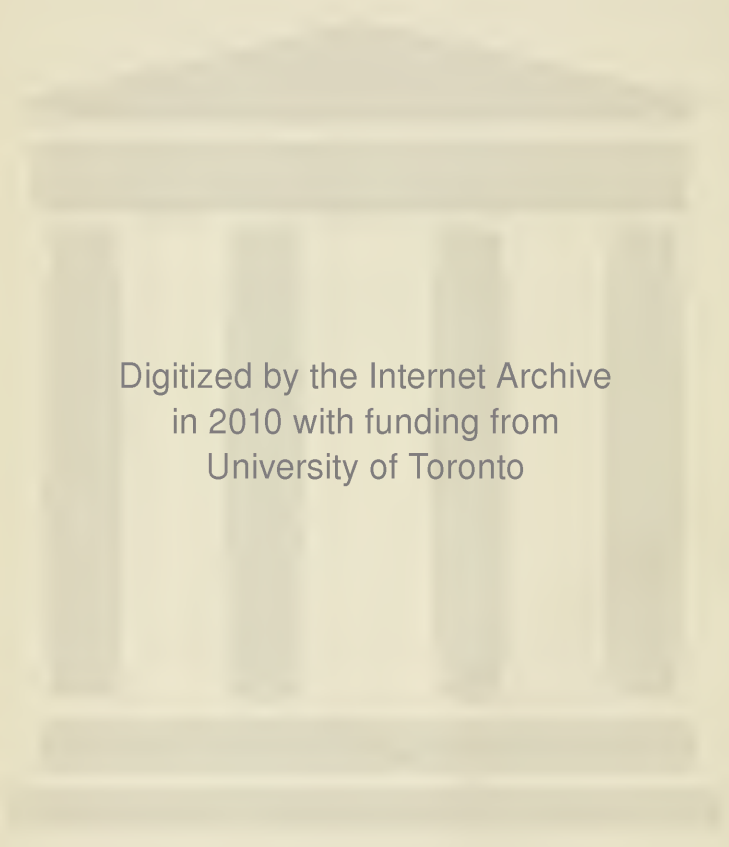
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LABORATORY NOTES ON FLUID EXTRACT OF CIMICIFUGA.

BY J. U. LLOYD, Cincinnati, O.

The Pharmacopœia directs to make this extract with stronger alcohol. I will not in the present article report any of my experiments with different menstruums; this paper can embrace only a few investigations without being longer than I desire it to be, consequently I select those in which I operated upon small amounts of material, as such correspond with the requirements of the Pharmacopœia. They were instituted and form the part of a series intended to instruct me for my laboratory work, so that I could as nearly as possible understand the comparative value of the processes which have from time to time been recommended for the preparation of fluid extracts. I assume that the menstruum directed by the U. S. P. is capable of completely extracting the principles which give to dry cimicifuga its therapeutical value. It may not be out of place to say that my experience teaches me that either water or glycerin injures the fluid extract of this drug. I also assume, in the part of the line of experiments which are embraced by this paper, that every grain of dry extractive matter has the same therapeutic value; that one grain of dry extractive matter taken from the first part of a percolate will produce the physiological action of a grain from any other portion. This, to an extent, may be inaccurate; the principle will not, I believe, hold good for articles like cinchona, hydrastis, and even podophyllum; but with such the relative values of different processes of percolation may be quite correctly determined by comparing the amounts of extractive matter at similar stages of each operation, providing the strength of the menstruum is not changed.

My experience is that I save time by instituting parallel examples of

each experiment, and generally carry on three, unless very large amounts are being worked; thus an error at any point in one of the experiments, or the neglect to secure a percolate at the proper time, will not cause the loss of time necessitated by the repetition of an extended experiment.

It is necessary, for proper comparison, to use material of the same quality throughout the entire operation. This point I always endeavor to provide for by supplying myself with an abundance before commencing. For these experiments I directed that 1,000 pounds of crude cimicifuga root be taken from a large pile, just as it came. I object to selecting a superior quality, as my aim is to experiment with such as is found upon the market, and we may expect the majority afterward to operate with. One-half of the thousand pounds was powdered in a chaser; the other half was coarsely ground.

In evaporating percolates, I find it almost impossible to work large amounts with any degree of satisfaction. A skim usually forms over the surface, which frequently almost completely prevents evaporation from beneath; from eight to ten days it may be expected will be required when this is the case, and even then all the liquid may not be driven off. The addition of a known amount of dry sand facilitates the operation; but I seldom use this plan, as frequently the residuum is to be examined, and the sand interferes. I favor moderately small portions of liquid, and in the experiments recorded here the second part of the first is the only example where more than one cubic centimeter was evaporated. Great care must be taken to expel all the alcohol from residuums, but too great a heat must be guarded against with an equal degree of caution. All extractive matters are not like that obtained from cimicifuga. A heat of 150° to 160° Fah. is sufficient for this article. I obtain the requisite temperature from a steam-coil drying-room; cold air passes over the coil of pipes at the bottom of the room, and, circulating around alternate ends and over the shelves, escapes at the top.

I take three equal amounts of each percolate; if there is sufficient variation to justify, I average the weight of the residuums. Mistakes may be very easily made, and often it is a satisfaction to have duplicates, especially where the result is contrary to preformed opinions.

For a base to compare with in this line of experiments I sought to find the amount of dry alcoholic extract a given number of grains of

cimicifuga contained. A half-inch glass tube was drawn at the bottom like a syringe, and plugged with a wad of cotton. 438 grains of powdered cimicifuga was moistened with alcohol, and carefully and firmly pressed into the tube; the powder was covered with a closely fitting paper, and alcohol added from a self-regulating supply-vessel until 112 fluidounces had passed.

One cc., carefully evaporated in watch glass, gave	. . . . .	.018 grain
Total yield of 112 fluidounces,	. . . . .	59.51 "

The powder was removed from the tube, dried, rubbed in a mortar, and again moistened with alcohol and replaced in the tube; alcohol supplied until 64 fluidounces had passed.

One fluid dram yielded .01 grain dry extract.

Total yield of 64 fluidounces,	. . . . .	5.12 grains
Total amount extracted from 438 grains of powdered cimicifuga		
by 176 fluidounces of alcohol,	. . . . .	64.63 "
One troyounce will contain	. . . . .	70.83 "
7680 grains (16 troyounces),	. . . . .	1133.26 "

About 14½ per cent.

The extraction of the resin from the powder may not have been absolute, but I think the operation was carried as far as could be desired. The first percolate, 112 fluidounces, was deep straw-color, the second very light.

I assume that if a fluid extract of cimicifuga represents the amount of powder employed, each portion of 16 fluidounces will contain 1133.26 grains of dry extractive matter, soluble in strong alcohol, and the ratio between the number of grains actually contained and 1133.26 represents the value of the fluid extract as compared with what it should be.

Experiment 1, U. S. P.—7,680 grains powdered cimicifuga, properly moistened and pressed into a cylindrical tube, three inches internal diameter, filled it ten inches in height. I had ten tubes constructed, of such diameter that the first would allow 7,680 grains to stand fifteen inches high; the second required twice 7,680 grains; the third three times 7,680, and so on until the tenth required ten times 7,680, the powder in each of the ten percolators occupying fifteen inches in height. The tubes were thirty-six inches long. To arrive at these sizes, I calculated the number of cubic inches the tube three inches in diameter and ten inches long contained (70.68), and from these known terms arrived at the diameter of the percolators (see tables).

Moveable diaphragms were made of perforated tin ; they were covered with muslin and so arranged as to rest at the bottom of each tube, nicely fitting into each. A round piece of filtering-paper was placed over them. Below the diaphragms the percolators tapered, funnel-shaped, to a small tube, where was attached a stop-cock. Commencing at the smallest, the ten percolators were arranged, in natural order, in a frame.

7,680 grains of powdered cimicifuga was moistened with 4 fluid-ounces of strong alcohol, and pressed into the smallest percolator ; the powder occupied 15 inches in height. The operation was repeated until 7,680 grains had been pressed into each of the ten, the powder being made to occupy a proportional less height as the diameter of the percolator increased. To reduce the powders to the height desired, I used cylindrical boards which accurately fitted each percolator, they were attached to graduated handles. Circular papers were placed over each powder, and held in place with pieces of perforated tin. The remainder of 16 fluidounces of alcohol was then poured upon each powder, the percolators covered with panes of glass and allowed to macerate four days. At the end of this time no liquid appeared at the exit tube of any percolator. 33 fluidounces of alcohol were then added (16 troy-ounces of powdered cimicifuga will absorb and hold from 24 to 25 fluidounces alcohol).

TABLE 1.

Amount of powder in each percolator.	Diameter of perco- lator.	Height of powder.	Am't of dry ex'tr. matter cont'd in 1 cc. of the per- colate, 14 floz.	Total amount of extractive matter in 14 floz.	Amount of dry ex- tractive matter cont'd in 1 cc. of the percolate, 10 floz.	Total dry extrac- tive matter in 10 floz. perco- late.	Total am't of dry extractive matter in the finished fluid extract.	Finished fluid ex- tract represents powdered Cimi- cifuga.
Grains.	Inches.	Inches.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
7680	2'45	15'	1'41	582'72	'18	53'14	635'86	4309'10
7680	3'46	7'5	1'25	516'60	'42	123'98	640'58	4341'15
7680	4'24	5'	'85	351'29	'76	224'35	575'64	3901'06
7680	4'90	3'75	75	309'96	'66	194'83	504'79	3420'92
7680	5'84	3'	'81	334'76	'35	162'36	497'12	3368'94
7680	6'	2'5	'70	289'30	'53	156'46	445'76	3020'82
7680	6'48	2'14	'62	256'23	'66	194'83	451'06	3056'79
7680	6'93	1'58	'85	351'29	'53	156'46	507'75	3440'98
7680	7'35	1'67	'57	235'57	'44	129'89	365'46	2476'67
7680	7'75	1'5	'86	355'42	'42	123'98	479'40	3248'85
76800				3583'14		1520'28	5103'42	34585'34

Percolators 6, 7, 8 and 9 allowed the alcohol to run directly through until from 4 to 8 fluidounces had passed, it was uncolored, then the flow slackened and the percolate became dark. I regulated the dropping and returned the alcohol which had passed, this last I had no authority for doing as our direction is positive to percolate 24 fluidounces and reserve the first 14. The operation was finished as the Pharmacopœia directs. See table No. 1.

Recapitulation.—According to the Pharmacopœia the powders are to remain in the percolators four days to macerate, but 16 fluidounces of alcohol are used, and the reading of the general directions leads me to expect a percolate will appear. This is not the case, however, 16 troyounces of powdered cimicifuga will absorb and hold 24 or 25 fluidounces of alcohol; to remedy this discrepancy the alcohol must be increased to at least 24 fluidounces. At the end of four days I carefully removed the tin and papers, the powders were found filled with numerous fissures from a mere fracture to one-eighth of an inch in diameter, in every case the powder had contracted and separated from the side of the percolators; they were not in a condition to percolate satisfactorily, but my object was to follow the process of the Pharmacopœia, and, after replacing the papers, I proceeded with the operation according to directions. By referring to the table it will be seen that the most successful pint of fluid extract represents nearly 9 troyounces of cimicifuga, the poorest a fraction over 5 troyounces. As regards the directions given in the U. S. P, I believe in all instances, except that mentioned which *avored* the extract, they were followed exactly; true, it may be said, a good pharmacist will not be likely to use a percolator 7.35 inches in diameter to work 16 troyounces of cimicifuga in, and, yet as the Pharmacopœia does not mention the diameter of the percolator to be employed, it might be answered that the diameter of the percolator is likely not a consideration of much importance else it would be named—that each of the extracts found in table No. 1 are official fluid extracts, inasmuch, as the requirements of the Pharmacopœia were met in the preparation of them all, and that an official fluid extract of cimicifuga may contain the virtues of from 5 to 9 troyounces of cimicifuga in 16 fluidounces of the fluid extract.

It will be seen that the first three percolators produced extracts which contained more extractive matter than any of the others, but the second contains more than the first, which is rather an exceptional

example. From the fifth there was no regularity, the difference in the height of the powders did not influence the result; indeed, the tenth percolator furnished an extract stronger than the sixth. This irregularity, to the greater extent, resulted from the cracks in the powder, which were caused by the four days' maceration with an insufficient amount of alcohol, when fissures form or the mass of the powder contracts and separates from the percolator; the menstruum, when added, passes through the crevices instead of permeating the material. This was particularly evident in percolators 6, 7, 8 and 9, where the alcohol run at once in an uncolored stream. My experience is that the powder should be kept covered with liquid from the commencement until the end of the process. There will be no greater loss of alcohol from evaporation if the entire amount to be used is added at the commencement. Extent of surface controls evaporation, and increase of bulk will not increase the surface if the percolator is cylindrical. Now, as 16 troyounces of cimicifuga will absorb 24 fluidounces of alcohol, and 24 fluidounces of percolate are to be obtained, it follows that the word forty-eight, substituted for sixteen in the official directions for making the fluid extract of this article, would make the percolate appear from the exit, as the wording of the directions leads us to anticipate, would prevent the formation of crevices, would add at one time sufficient alcohol to furnish both the percolates, and would not increase the expense. I will pass on now, and briefly notice experiment No. 2, differing from this only in the fact that the powders were not macerated.

Experiment 2.—The same percolators were prepared; 7,680 grains of powdered cimicifuga were moistened with 4 fluid ounces of alcohol. This amount was placed in each of the ten percolators, pressed until it occupied the same height as in the corresponding percolators of previous experiment, and covered in like manner with circular papers. Forty-four fluidounces of alcohol were added to each, and percolation proceeded with at once. The percolate from each was collected in portions of 14 and 10 fluidounces, after which the fluid extract was finished as the Pharmacopœia directs. See table 2.

Recapitulation.—In this series no cracks formed in the powders. The first percolator gave the largest total yield of extractive matter, representing about $11\frac{1}{3}$ troyounces of cimicifuga. The ninth contained a little more than enough to represent seven. Compared with the preceding table, there is a decided increase in the value of each extract,

with one exception, the eighth, where, by a somewhat remarkable coincidence, corresponding percolates contain the same amount of extractive matter. There is a rapid decrease in the value of the extracts from the first to the seventh, beyond which the diameter of the percolator does not influence the result. The seventh, with a height of powder 2.14 inches, furnishes an extract inferior to the tenth with only 1.5 inches; indeed, this last is superior to any above it, until the sixth is reached. It will be remembered that in my comments upon the first table I imputed this (much larger) irregularity to be mainly due to the fissures in the powder, caused by the process of maceration. There are other causes why a powder of little depth cannot be exhausted with any degree of certainty—causes which I believe the most careful cannot easily overcome, or sufficient usually to about counterbalance the advantage accruing from so slight an increase of depth as there was between the powders in each of the latter five percolators. I believe these variations in every case are governed by natural laws, which I cannot dwell upon just now. The ten pints of finished fluid extracts contained a total of 41965.88 grains extractive matter an average of 8.7 troyounces to the pint. The extracts from table No. 1 represented only 7.2 troyounces, being a difference of 21 per cent. in favor of percolation without maceration. Taking the first percolator of each table, the difference is 30 per cent. in favor of percolation without maceration.

TABLE 2.

Amount of powdered <i>Cimicifuga</i> in each percolator.	Diameter of percolator.	Height of powder.	Am't of dry extractive matter contained in 1 cc. of the percolate, 14 floz.	Total dry extractive matter in 14 floz.	Amount of dry extractive matter contained in 1 cc. of the percolate, 10 floz.	Total extractive matter contained in percolate, 10 floz.	Total extractive matter contained in the finished fluid extract.	Finished fluid extract represents powdered <i>Cimicifuga</i> .
Grains.	Inches.	Inches.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
7680	2.45	15'	1.67	690.18	.46	135.79	825.97	5597.52
7680	3.46	7.5	1.52	628.19	.44	129.89	758.08	5137.44
7680	4.24	5'	1.22	504.20	.60	177.12	681.32	4617.24
7680	4.90	3.75	1.19	491.80	.57	168.26	665.06	4473.17
7680	5.43	3'	1.17	483.54	.55	162.36	645.90	4377.21
7680	6'	2.5	1.10	454.61	.42	123.98	578.59	3941.5
7680	6.43	2.14	.83	343.02	.49	144.65	487.67	3347.0
7680	5.93	1.88	.85	351.29	.53	156.46	507.75	441.98
7680	7.35	1.67	.99	367.60	.47	138.74	506.34	431.42
7680	7.75	1.5	.83	343.02	.67	197.78	540.80	564.5
76800				4667.45		1535.03	6192.48	4175.8

I come now to the third experiment, where the plan recommended in the U. S. D., page 1164 (note), for cinchona was applied to cimicifuga, the operation being suspended when the official amount of percolate was obtained.

Experiment 3.—Ten portions, each 7,680 grains of powdered cimicifuga, were intimately mixed, each separately, with 32 fluidounces of alcohol, and allowed to macerate 30 minutes, when each portion was transferred to a percolator—the ten percolators being those before used. When the liquid disappeared below the surface of the powder, alcohol was added until a sufficient amount of percolate had been obtained, said percolates being reserved in portions each of 14 and 10 fluidounces. The fluid extract was completed according to the directions of the U. S. P. See table 3.

TABLE 3.

Amount of powder in each percolator.	Height of powder in each percola- tor.	Diameter of perco- lator.	Am't of dry extr't contained in 1 cc. of the percolate, 14 floz.	Total extract in 14 floz.	Am't of dry extr't contained in 1 cc. of the percolate, 10 floz.	Total dry extract in 10 floz.	Total am't of dry extractive matt'r in the finished fluid extract.	Finished fluid ex- tract represents powdered Cimic- ifuga.
Grains.	Inches.	Inches.	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
7680	15'	2'45	'72	297'56	'74	218'45	516'01	3496'85
7680	7 5	3'46	'71	293'43	'70	206'64	500'07	3388'93
7680	5'	4'24	'76	314'09	'52	153'50	467'59	3168'81
7680	3'75	4'90	'66	272'76	'50	147'60	420'36	2848'74
7680	3'	5'48	'71	293'43	'57	168'26	461'63	3128'83
7680	2'5	6'	'64	264'50	'59	174'17	438'67	2972'83
7680	2 14	6 48	'68	281'03	'58	171'22	452'25	3064'86
7680	1'88	6 93	'70	289'30	'60	177'12	466'42	3160'89
7680	1'67	7 35	'74	305'83	'52	153'50	459'33	3112'84
7630	1'5	7'75	63	260'37	'48	141'70	402'07	2724'79
76800				2872'30		1712'16	4584'46	31068'17

Although the maceration is continued only 30 minutes, it strikes me the process may better be called percolation with maceration, than that of the U. S. P. A marked peculiarity of the result of the ten experiments is the regular amount of extractive matter contained in the fluid extracts; but while there is more certainty as to the regularity of the extracts made by this method, judging from these experiments, each

extract is, with one exception, inferior to the corresponding extract in the former tables. The total amount of cimicifuga represented is 3516·97 grains less than represented by the U. S. P. process, and 10897·51 grains less than by simple percolation. The average of the ten pints makes each 16 fluidounces of fluid extract represent 6·5 troy-ounces of cimicifuga, which is 34 per cent. in favor of percolation without maceration, as represented by the second experiment. One very great objection to the process just described arises from the fact that the powders settle in a tough mass, so compact as to almost prevent the passage of the alcohol; percolator No. 1 with a diameter of 2·45 inches requires considerable pressure when the moistened powder is made to occupy 15 inches in height. But by this process the powder settles until it occupies only 11 inches. Indeed, with this percolator the liquid ceased to drop at all, and I was compelled to stir the powder with a spatula. It will be remembered that this operation was discontinued when the amount of percolate directed by the official formula for fluid extracts was obtained. I will now call attention to the following experiment, where the entire process recommended for solid extract of cinchona, as I understand it, was applied to cimicifuga.

3,840 grains of powdered cimicifuga were mixed with 16 fluidounces of alcohol, allowed to stand 30 minutes, and poured into an ordinary glass percolator, diameter of top 10 inches, bottom $1\frac{1}{2}$ inches. When the liquid disappeared below the surface of the powder alcohol was added, until the total amount of percolate desired (56 f $\bar{3}$) was obtained in fractions, as explained by table 4.

3,840 grains of powdered cimicifuga was mixed with the first percolate (16 f $\bar{3}$) from the preceding fraction, allowed to stand 30 minutes, and poured into a percolator similar to the preceding. When the liquid disappeared beneath the surface of the powder it was followed with the succeeding percolates in the order they were obtained, each being permitted to disappear before the following one was added; finally, the operation was completed with alcohol. The percolates were reserved in portions, as explained by table 4, until 60 fluid ounces were obtained. The first percolate (16 f $\bar{3}$) of the preceding operation was mixed with a third portion of 3,840 grains of powdered cimicifuga, allowed to macerate 30 minutes, and poured into a percolator like those used in the preceding examples. This was followed with the remainder of the percolates, the result being also separated, as obtained, into

fractions—see table 4. Towards the last, alcohol was added to obtain the requisite amount. The first two fractions were mixed and reserved, the remaining were mixed and evaporated until reduced to 3 fluid-ounces, then added to the reserved 21 fluidounces. See table 4.

TABLE 4.

Percolate from first 8 oz. powdered Cimicifuga.	Dry extract con- tained.	Percolate from 2d 8 oz. powdered Cimicifuga.	Dry extract con- tained.	Percolate from 3d 8 oz. powdered Cimicifuga.	Dry extract con- tained.	Extractive matter contained in 16 floz finished fld. extract.
Fluid oz.	Grains.	Fluid oz.	Grains.	Fluid oz.	Grains.	Grains.
16	393·88	16	760·43	16	767·76	
8	54·20	8	76·75	5	109·22	
8	30·66	8	49·58	8	80·29	
8	25·60	8	47·22	8	49·59	
8	19·20	8	43·68	8	47·50	
8	17·28	8	41·32	8	45·41	
		4	17·12	8	38·96	
				7	30·99	
56	540·82	60	1036·10	68	1169·72	778·48

Recapitulation.—The 56 fluidounces of percolate obtained from the first 8 troyounces of powder contained 540·82 grains of dry extractive matter. This percolate with the extractive matter contained was passed through the second portion of powder (8 troy ounces), being followed with enough fresh alcohol to make 60 fluidounces, containing a total of 1036·10 grains of dry extractive matter. Deducting that derived from the first portion of powder leaves us 495·28 grains as the result of the second operation. The third 8 troyounces of powder was percolated with a menstruum already containing 1036·10 grains of extractive matter. Fresh alcohol enough was added to produce 68 fluid-ounces of percolate, which contained 1167·72 grains of extract, deducting that obtained from the 16 ounces of powder of the two former operations leaves 131·62 grains. Sixteen fluidounces of the finished fluid extract contained 778·48 grains; of this, 665·77 grains were con-

tained in the first 24 fluidounces of percolate, consequently 44 fluid-ounces of alcohol were required to extract 112·71 grains of extractive matter.

This operation I found very tedious and troublesome. As mentioned in connection with experiment third, cimicifuga settles into a tough mass when worked in this way, so compact as almost to prevent the menstruum from passing. More than three weeks were consumed in preparing this 24 fluidounces of fluid extract. I gave the experiment every attention possible for me to spare from other operations. I stationed a boy part of the time to reserve the percolates, and with all my care occasionally the surface of the powder would become exposed and crack. Necessarily, I was compelled to suspend the operation nights and upon the sabbath.

TABLE 5.

Percolate from 24 oz. powdered Cimicifuga.	Dry extract contained.	Extractive matter contained in 16 floz. finished fluid extract.
Fluid ounces.	Grains.	Grains.
16	805·08	
5	134·30	
8	89·76	
8	55·52	
8	43·68	
8	41·36	
8	40·16	
7	26·88	
68	1236·74	824·46

When this line of experiments was commenced I also instituted an example with simple percolation, corresponding excepting that the powder was placed in a single percolator. The percolate was received in similar portions; table No. 5 tabulates the result. Comparing the two operations I find that simple percolation extracted 69·02 grains of extractive matter more than repercolation. In the first thirty-six fluid-ounces, corresponding with the amount of percolate derived from 24 troy-

ounces of powder by the official process, repercolation falls 79·66 grains short of simple percolation; this will make sixteen fluidounces of fluid extract by repercolation, lack 53·11 grains of the simple percolation, equivalent to 359·01 grains of *cimicifuga*. Repercolation represents nearly $9\frac{1}{2}$ troyounces of *cimicifuga*; percolation about 10 troyounces, being 5 per cent. in favor of simple percolation. These experiments can only compare repercolation and percolation by this (to me) unsatisfactory process. The theory of repercolation, as I understand it now, presents quite a different aspect. I will introduce two similar experiments, intended to compare percolation and repercolation; both were instituted at the same time, both had the same total height of powder, and to both I gave all the care possible.

Repercolation.—3,840 grains of powdered *cimicifuga* were moistened with 2 fluidounces of alcohol and pressed into a cylindrical percolator three inches in diameter until the powder occupied 5 inches in height. It was covered with a circular paper, held in place with a perforated piece of tin, and 35 fluidounces of alcohol added. The percolate was separated as it passed into portions of 6, 3, $4\frac{1}{2}$ and 9 fluidounces. The first, $6f\bar{3}$, was reserved.

TABLE 6. *Result of Experiments by Repercolation.*

Amount of powder operated upon.	Amount of perco- late.	Amount of dry ex- tractive matter in 1 cc.	Total amount of extractive mat- ter in each per- colate.	16 floz. of finished fluid extract	
				contain dry ex- tract.	represent powd'd <i>Cimicifuga</i> .
8 oz.	6 $f\bar{3}$	1·57 gr.	278·08 grs.		
8	7·5	1·32	292·25		
8	10·5	1·30	402·95		
24	24·		973·28	648·85 grs.	4397·20 grs.

3,840 grains of powdered *cimicifuga* were moistened with the second portion of the percolate ($3f\bar{3}$) from the last powder. It was pressed into a three inch percolator until it occupied five inches, and was then covered with paper like the last, and the two remaining fractions of the percolates added in the order they came. The first ($4\frac{1}{2}f\bar{3}$) being permitted to disappear before it was followed with the other. Alcohol was

finally added until the desired amount of percolate was obtained. This was divided as it came into three portions, $7\frac{1}{2}$, $4\frac{1}{2}$ and $4\frac{1}{2}$ fluidounces. The first, $7\frac{1}{2}$, was reserved.

3,840 grains of powdered *cimicifuga* were moistened with 2 fluidounces of the second percolate obtained in the preceding operation; pressed into a three inch percolator until it occupied five inches in height. The remainder of the $4\frac{1}{2}$ fluidounces of percolate was added, allowed to disappear, followed with the last percolate, $4\frac{1}{2}$ f $\bar{3}$, and then at once with alcohol. Ten and a half fluidounces of percolate were obtained; this and the two reserved percolates were mixed together, representing 24 fluidounces of the fluid extract of *cimicifuga* made by the repercolation process. Table No. 6 shows the result.

Simple Percolation.—24 troyounces of powdered *cimicifuga* were moistened with 6 fluidounces of alcohol, and pressed into a three inch cylindrical percolator until it occupied 15 inches in height. After being covered with a circular piece of filter paper, 60 fluidounces of alcohol were added and percolation continued until 24 fluidounces of percolate were obtained; this was reserved in three fractions to correspond with the three reserved percolates of the repercolation process. Table No. 7 places the result where the two processes can be compared.

TABLE 7. *Result of Experiments by Percolation.*

Amount of powder operated upon.	Amount of perco- late.	Amount of dry ex- tractive matter in 1 cc.	Total amount of extractive mat- ter in each per- colate.	16 floz. of finished fluid extract	
				in 1 cc.	represent powd'd <i>Cimicifuga</i> .
24 oz. powder	10'5 f $\bar{3}$	1'96 gr.	607'52 grs.		
The same powder	7'5	1'38	305'55		
The same powder	6	'93	164'72		
	24'		1077'79	718'51 grs.	4869'28 grs.

Recapitulation.—The total amount of extractive matter obtained by the repercolation process was 973'28 grains, by simple percolation 1077'79, being an excess in favor of simple percolation of 104'51 grains, which represented 708'25 grains of *cimicifuga*. Sixteen fluidounces of the finished fluid extract represented near 9 troyounces of *cimicifuga*

by the repercolation process, and 10 by simple percolation, being a difference of 11 per cent. in favor of simple percolation.

10½ fluidounces of percolate, the third reserved portion by repercolation, I represent as corresponding with the first percolate—simple percolation—because this is the only fraction which passes through the entire 24 troyounces of powder by the repercolation process, but it should be remembered that 16 troyounces have been submitted to the action of two previously reserved portions, consequently it must not be expected that an equal amount of matter will be extracted by the two percolates, and a comparison of results shows that the repercolation fraction contains less than percolation by 204.57 grains. The second percolate, 7½ fluidounces, passes in the repercolation process through 8 troyounces of powder, which have not been submitted to the action of any previous percolate, also through 8 troyounces, which have been partly extracted by the reserved percolate (6f5). The corresponding fraction in simple percolation passes through 24 ounces of cimicifuga, all of which has been partly exhausted by the preceding percolate, the result shows us that this fraction contains 13.30 grains more extractive matter in the simple percolation process.

The other reserved portion, 6 fluidounces, is the first by the repercolation process, and is actually simple percolation where the first 6 fluidounces of a percolate, from 8 troyounces of cimicifuga, are reserved. By simple percolation the corresponding percolate is the last, and passes through 24 troyounces of cimicifuga, which have been depleted to a large extent of soluble materials by the action of two preceding percolates, (reserved as two). It is seen that this percolate contains 113.36 grains less by simple percolation than by repercolation, but the excess of extractive matter contained in the first two portions, in favor of simple percolation, makes the total result 104.51 grains in favor of that process.

In the preceding, I have illustrated, by seven tables, my experience with four different processes for making fluid extract of cimicifuga, embracing 34 experiments. The following table (No. 8) gives the value of the best fluid extract of each process.

TABLE 8.

Taken from Table	16 fluidounces of fluid extract made by	Represents dry extractive matter.	Represents grains of Cimicifuga.	Or of the total am't of extract in the root, taken as the unit.
No 2	Percolation without maceration	825'97 grs.	5597'52 grs.	'730
6	Repercolation	648'85	4397'20	'573
1	U. S. P.	640'58	4341'15	'565
3	U. S. D Page 1164 (note)	516'01	3496'85	'455

None of the experiments produced with the official amount of alcohol, an extract to represent the powder, operated upon. To arrive at any certainty, many times this number of disinterested investigations must be put upon the official fluid extracts. The result of the line I offer, unmistakably favors simple percolation *without maceration*; but fluid extract of cimicifuga may possibly be exceptional, and it would not be well for those who have not experimented farther to prepossess themselves in favor of any theory from the summing up of the few experiments I offer in this paper. Of primary importance, to pharmacists, is the question, "can we practically produce a liquid extract each fluidounce of which will contain the medicinal principles of one troyounce of crude material, on operating with such quantities as the U. S. P. directs?"

ON A DISTILLATORY APPARATUS.

BY JOSEPH P. REMINGTON.

Having occasion to use frequently the ordinary forms of pharmaceutical stills, for recovering alcohol, in making fluid extracts, and for other purposes, and noticing some defective points in their practical operation, the writer finally contrived the apparatus which is figured in the cut, and a continuous use of over three years, having proved its efficiency, it is herewith submitted.

The greatest objections to the pharmaceutical stills, usually sold by the makers, are the use of the water joint, and the short distance remaining between the delivery-pipe and the source of heat when the still is in position. The water-joint is always objectionable; when the still is in use, constant care and attention is required to keep it full of

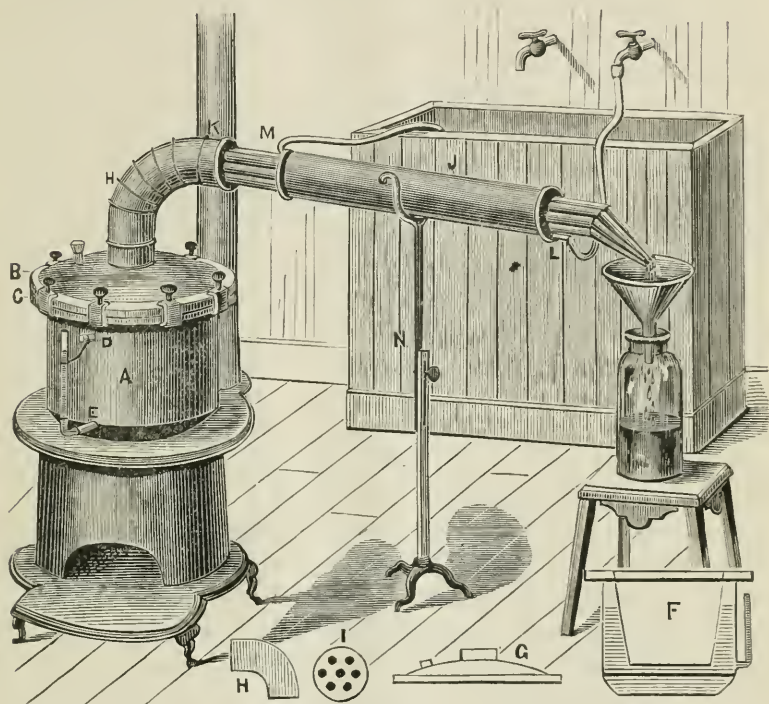
water on account of evaporation, and a sudden tilt or shake requires a readjustment. In some of the stills, where the spirit is condensed upon the dome, the water in the joint gradually evaporating, is replaced by the condensed alcohol, which is wasted by the evaporation, even if more serious consequences do not result, *i. e.*, the sudden bursting into flame by contact with the fire used as a source of heat. The second objection may be counterbalanced, if care is used ; but it sometimes happens that the water-supply, used for condensation, suddenly fails, and if alcoholic vapor issues from the delivery-tube, instead of condensed spirit, explosion will likely ensue if it comes in contact with flame.

As expense has usually to be considered in the construction of apparatus for pharmaceutical use, especially if intended for occasional employment, the effort was made to keep the cost down to the lowest point consistent with utility and convenience of application.

It is presumed that most pharmacists use a low stove, such as here figured, or a gas stove, or have access to a kitchen range or furnace. The still proper, A, thirteen inches in diameter, may be constructed of copper, and if a copper can, in which oils of lemon, bergamot, orange, etc., etc., are imported, can be procured, a new bottom may be brazed into it by a coppersmith, and the whole tinned inside ; the top is cut off, and two flat brass rings, B and C, one and a half inches wide and half inch thick, are obtained and soldered or riveted to the top and body of the can, as shown in the cut ; two half inch short copper tubes D and E are fastened to the body of the still, communicating with the inside for use as a water level ; a glass tube bent at right angles at top and bottom is fastened by two short pieces of rubber tube to the copper tubes for this purpose ; when the water bath is used (hereafter described) the upper end of glass tube is drawn out of the rubber tube, in order to afford egress for the steam through the upper tube D. A three quarter inch copper tube is let into the top to supply the liquid to be distilled, of course furnished with a cork, when the still is used. A water bath of tinned copper or tinned iron of the shape shown in F, with a flat rim, which accurately fits the brass flat ring, should be provided.

A four inch opening is made in the copper top G, to which is fitted the elbow H ; this elbow is best made of tinned copper, but this may be replaced by a tinned iron, "lobster back," gutter-pipe elbow, if first cost must be curtailed. There is an advantage in widening this tube : first, in affording more space for the accommodation of vapor

rapidly forming, and, secondly, for the greater facility with which it may be cleansed, there being no difficulty in getting the hand inside to scour it out.



The condenser, J, however, is the most important part of the apparatus and consists of seven tubes one inch in diameter, thirty-two inches long, surrounded by a cylinder five inches in diameter and twenty-four inches long; the seven tubes are arranged as seen in sectional view I. A cap, K, two inches deep, soldered to the condenser, fits tightly over the elbow H, so that a tight joint is made here—this may be rendered perfectly tight by tying around it a strip of moistened bladder.

A short tube, L, at the bottom of condenser is connected with a rubber tube from hydrant for supplying cold water, and a similar tube at M conveys the heated water into the sink.

The ends of the condenser tubes are drawn together and tapered so that a bottle with an inch and a half mouth may be used for collecting the distillate.

An iron stand, N, adjusted by raising or lowering the U-shaped support, and fastening at any required angle, by means of the screw in the centre, is a convenient way of supporting and keeping in place the whole apparatus—but this may be replaced by a wooden box, cut so as to receive the condenser and blocked up from below to the proper height as required.

The joint between the still and dome is best made by inserting a wetted hempen cord—as used in Dr. Squibb's laboratory, Brooklyn—the thick twine which is used by the paper manufacturers to bundle reams of wrapping paper answers very well), between the two brass rims B, C, and clamping together, placing the clamps at equal distances, and arranging alternately, so as to secure a uniform pressure.

The advantages which seem to be possessed by this distillatory apparatus are as follows: All parts may be readily cleaned, and, as it is intended for the use of the pharmacist, in the limited space usually afforded for manipulations, care has been taken to make it as compact as is consistent with safety and efficiency. The condenser has the advantage of the worm in affording *extent of surface* to the refrigerating action of the cold water, and is seven times more efficient than the ordinary Liebig's condenser, from the fact that seven tubes are employed instead of one. The advantage of the Liebig is retained—that of the facility with which it may be cleaned by simply passing a rattan, armed with a sponge or muslin rag, which is tied around the end, through each straight tube in turn, and rinsing with warm water or suitable liquid. The disadvantage of the worm for pharmaceutical use, *i. e.*, the great difficulty in cleaning, especially when the still is needed for a variety of purposes, is thus avoided.

The principle of increasing the extent of surface to obtain greater efficiency without adding materially to the size, which has been used so long in the construction of locomotive boilers, was taken advantage of here, with the view of getting similar advantages by the reverse effect. The diameter of the tube being 1 inch, and length exposed to the refrigerating action of water 24, the area would be slightly over 75 inches; this, multiplied by seven, gives the whole extent of surface, 525 inches. Now, the diameter of the outside cylinder surrounding the tubes is 5 inches, this multiplied by 3.1416 , and this by 24, would give the surface of the cylinder, nearly 377 inches, and this lacks about 30 per cent. of the extent of surface of the seven inside tubes; so that

there is 30 per cent. more surface exposed by the condensing tubes than is possessed by the containing cylinder.

To the pharmacist, occupied by many various duties, it is an object to be able to save time and trouble, and, with a little practice, it is not difficult with a good fire and the ordinary water supply, in moderate weather (water at 50°F.) to recover a gallon of alcohol from weak tincture in fifteen minutes; the whole apparatus may be set up, the distillation finished, and all finally cleaned and put away easily in 30 minutes. Seven streams issue from the delivery-tubes of the condenser instead of one, and the danger arising from alcoholic vapor issuing uncondensed on account of urging the fire, and communication with flame, is almost prevented by the increased power of the condenser.

The condenser should have the inside surface protected from rust by a thick coat of red lead and oil, if made of tinned iron.

Philadelphia, Twelfth mo. 10th, 1877.

GLYCERIN IN PHARMACY.

BY C. J. BIDDLE, PH.G.

Read at the Pharmaceutical Meeting, December 18, 1877.

Of the discoveries of Scheele, glycerin is one of the most important and useful; although nearly a century has passed since its discovery, it has not been in extensive use but for comparatively few years; improvements in the mode of production have both increased its purity and reduced its cost to the consumer, so that at present its uses in the arts and manufactures are innumerable.

Glycerin entered the list of preparations of the Pharmacopœia in 1850, and was transferred to the materia medica list in 1860; about this period it appeared to be beginning to claim the notice of pharmacists; as in 1865 Mr. Alfred Taylor, of this city, recommended its use in the manufacture of fluid extracts,¹ and since then numerous formulas have appeared in the pharmaceutical journals, the result of which was that our present edition of the Pharmacopœia contains a list of preparations called "Glycerita," and glycerin enters into about thirty-six other officinal preparations. But its use is not limited to the few now officinal, and it can be advantageously used in many more

¹ "Am. Jour. Pharm.," 1865, p. 50.

preparations. Every pharmacist has a just pride in having his preparations to present an elegant appearance, and glycerin will be found useful as a help to accomplish this purpose.

The property glycerin possesses of preventing tincture of kino from gelatinizing has been known for some time, and frequently published.¹

In 1874, at the request of Mr. Wm. F. Bender, Chief Apothecary at the Philadelphia Hospital, I began to use glycerin in syrup of wild cherry, and have used it since that time, always obtaining a much richer-looking syrup than the officinal, which contains all the virtues of the bark. The formula is as follows :

Take of Wild cherry, in moderately fine powder, . . .	℥v
Sugar, granulated,	℥xxvi
Glycerin, concentrated,	℥ii
Water, a sufficient quantity.	

Mix one ounce of glycerin with four of water, moisten the powder and allow it to stand 36 hours in a close vessel ; then pack it firmly in a conical percolator, and gradually pour water mixed with the remaining glycerin until a pint of filtered liquid is obtained ; then proceed as usual. A formula somewhat differing from this in the details has been recommended in the "Druggists' Circular," 1874, p. 59.

Glycerin has also been found useful in the preparation of several of the officinal tinctures, for the different classes of which it is used in different proportions. For the resinous tinctures, half an ounce in a pint is quite sufficient ; it will produce a percolate of much richer color, and will more thoroughly exhaust the drug. For the astringent and those containing large quantities of coloring matter, one ounce in a pint will prevent precipitation for a much longer time than without it.

By following the general formula given below I have been able to produce very fine tinctures, taking tincture of myrrh for example :

Take of Myrrh, in fine powder,	℥iii
Glycerin, concentrated,	℥i
Stronger alcohol,	Oi
Alcohol, a sufficient quantity.	

Mix the glycerin with five ounces of stronger alcohol, and pour upon the myrrh, previously placed in a wide mouth bottle of sufficient

¹ "Am. Jour. Pharm.," 1877, p. 299.

capacity ; cork tightly, and allow it to stand for four days, with occasional agitation ; then place it upon a filter, in a funnel, and allow the first added menstruum to filter through ; mix the remaining stronger alcohol with one pint of alcohol, and gradually pour upon the myrrh, adding sufficient alcohol to obtain two pints of tincture.

Maceration followed by percolation produces a much finer tincture than direct percolation ; in all tinctures for which glycerin is used I endeavor to keep them of full alcoholic strength of the Pharmacopœia.

Glycerin has another very desirable effect in resinous tinctures, as it prevents the accumulation of resin about the stopper and lip of the bottle, and will prevent the stopper from becoming fastened ; also "the drop" that falls on the outside of the bottle, from time to time, can be easily removed with a dampened cloth ; for these advantages alone it would more than compensate for the amount of alcohol necessarily used to cleanse the bottles containing such tinctures. Glycerin was recommended in compound tincture of cinchona as early as 1872.¹

In the officinal wines it may be used with advantage also. Wine of ergot, of superior quality, possessing a stronger odor and a richer color than the officinal, is made as follows :

Take of Ergot, in moderately fine powder,	.	.	℥iv
Glycerin, concentrated,	.	.	℥iss
Sherry wine, a sufficient quantity.			

Mix the glycerin with five ounces of sherry wine, moisten the powder with this ; place in a close vessel and let stand four days ; then transfer to a funnel or percolator ; press firmly and gradually ; pour sherry wine upon it until two pints of filtered liquid are obtained. This method is to be preferred to making this preparation from the fluid extract, and would suggest that wine of ipecac be made in a similar manner, and that glycerin be used in the remaining wines.

In the preparation of solid extracts a small proportion has been recommended to be added, after evaporation to the proper consistence, to give them a plastic firmness, which is at times very desirable, and also prevents moulding.²

As an excipient, in pill masses, its virtues are too well known to need repetition here.

It may be substituted for honey in compound tincture of cardamom,

¹ "Drug. Circular," 1872, p. 96. ² "Drug. Circular," 1872, p. 139.

and produce quite as richly colored tincture ; but in the camphorated tincture of opium the color is not so rich as in the officinal.

Glycerin has been recommended to take the place of carbonate of magnesium in the officinal waters made from oils ; but I have failed to produce as good results as with the latter. It will not answer for camphor water, as camphor is not sufficiently soluble in glycerin, even when heated ; for the camphor will volatilize before the glycerin is hot enough to dissolve it. But in extracts, mixtures, tinctures and wines of the Pharmacopœia glycerin will be found useful.

Philadelphia Hospital, Philadelphia, Pa.

ELIXIR OF NUX VOMICA AND AROMATIC TINCTURE OF ANGUSTURA.

BY E. J. DAVIDSON, Ph. G.

A pleasant aromatic tincture of angustura, which is a fair imitation of the so-called Angustura bitters, is obtained by the following formula :

Take of Powdered Angustura,	℥ii
“ Cascarilla,	℥iv
“ Bitter orange peel,	℥iv
“ Cinnamon,	℥iv
“ Cardamom,	
“ Cloves,	
“ Nutmeg,	ʒā ℥ii
“ Coriander,	℥ii
“ Anise,	℥v
Glycerin,	f℥ii
Dilute alcohol, sufficient.	

Mix the glycerin with a pint of the diluted alcohol, moisten the mixed powders, pack into a percolator and displace first with the mixture, afterwards with diluted alcohol until two pints of tincture are obtained.

This tincture will assist in disguising the disagreeable bitter taste of nux vomica, and an elixir of the latter, not unpleasant in taste, may be obtained as follows :

Take of Tincture of nux vomica,	gtt. cxx
Curacoa cordial,	f℥iii
Syrup of orange peel,	f℥iiss
Aromatic tincture of Angustura,	f℥ss
Mix.	

The dose of this elixir will be about a tablespoonful, representing 10 drops of tincture of nux vomica ; the proportion of the latter may, of course, be varied if desirable.

SHORT WEIGHT IN SUGAR-COATED PILLS.

BY E. M. WELLS, PH.G.

Pharmacists are cautioned not to purchase or use sugar-coated pills without carefully examining them. A large lot was recently received from a manufacturer in New York. When those marked Compound Cathartic Pills, U. S. P., were opened for dispensing, their small size attracted my attention. The dry material for three comp. cathartic pills, U. S. P., weighs $10\frac{3}{4}$ grains. The official formula was on the wrapper accompanying each box and bottle. The average weight of three of the bought pills, with coating, was found to be 11 grains, and after the coating was removed, 6 grains. The sugar-coating weighed, therefore, 5 grains, and there was a deficiency of $4\frac{3}{4}$ grains of what the dry material should weigh, equal to 44 per cent. The moisture contained in them was not considered.

So-called improved compound cathartic and Cook's pills were *only* 33 per cent. short in weight.

Fort Worth, Texas, Nov. 15th, 1877.

SOLUTION OF DIALYZED IRON AS AN ANTIDOTE FOR ARSENICAL POISONING.

BY RICH. V. MATTISON, PH.G.

Read at the Alumni Meeting, December 7.

The statement having been currently made by a number of manufacturers of solution of dialyzed iron that this article was of great value as an antidote in cases of arsenical poisoning, and this statement, having subsequently been either doubted or "damned with faint praise" by recent writers, led the author to undertake, for personal satisfaction no less than the general good, to perform the following experiments, with the idea of directly confirming one or the other of the above views. In furtherance of this object, a careful test was made of the glassware and reagents employed for the presence of arsenic, with negative results.

A. Ten centigrams of arsenious acid was dissolved in 25 cubic centimeters of distilled water, and tested for arsenic, abundant evidence of which was readily shown. To this solution 5 cubic centimeters of a 5 per cent. solution of dialyzed iron was added, and the whole diluted with distilled water to the measure of 100 cubic centimeters, and filtered. No apparent change was effected, the filtrate giving abundant evidence of the presence of arsenic. The experiment was again performed, substituting ordinary water, with like result.

B. A like quantity of arsenious acid was dissolved in the same amount of distilled water as before, with the addition of a few drops of hydrochloric acid, and to this solution 5 cubic centimeters of solution of dialyzed iron was added, and the filtrate tested as before, with like result. The experiment was then varied by the substitution of ordinary water and the addition of, first, 1 cubic centimeter of the iron solution, and afterward the addition of 25 cubic centimeters, and dilution of the whole with water to the measure of 100 cubic centimeters; the various testings were without change, the abundance of arsenic being readily shown.

C. A third experiment was now instituted. Ten centigrams of arsenious acid being taken as before, and dissolved in the same quantity of water, this was added to 1,000 cubic centimeters of a solution made to represent the gastric secretion of the human stomach, and composed as follows :

Water,	994.40	Chloride calcium,	0.06
Pepsin,	3.19	Hydrochloric acid,	0.20
Chloride sodium,	1.46	Phosphate magnesium,	0.12
Chloride potassium,	0.55		

The quantity of this fluid taken (1,000 cubic centimeters) was believed to represent about the normal quantity of gastric juice present in the human stomach during digestion, or that would be induced upon the ingestion of a quantity of arsenic. Immediately after the addition of the iron solution, the whole was transferred to a filter, and the colorless filtrate tested by Fleitmann's and Marsh's test. No evidence of the presence of arsenic could be discovered, and the experiment was repeated with like result.

The experiment was then varied by dissolving 50 centigrams of arsenious acid in the above quantity of artificial gastric fluid, and allowing the whole to remain at a temperature of 38°C. (100°F.) for two

hours, with occasional agitation. The mixture was then transferred to a filter, and 100 cubic centimeters of the filtrate evaporated to 5 cubic centimeters, and this added to a Marsh's apparatus of 100 cubic centimeters capacity, without the slightest trace of arsenic being shown on the application of the test.

This experiment was repeated with like result, with both Fleitmann's and Marsh's tests, without a trace of arsenic being obtained.

After the repeated unsuccessful attempts, to detect the presence of arsenic in this way, one drop of liquor arsenii chloridi was added to each flask (still containing the filtrates as above described), and the result was immediate, the presence of arsenic in considerable quantity being instantly shown by the characteristic reactions.

Through these experiments, then, the facts seem clearly set forth, (1) that dialyzed iron, to be of value as an arsenical antidote, must be first precipitated by the action of some neutral salt, (2) that this precipitation, and the consequent production of ferric hydrate, is accomplished when this preparation is taken into the stomach, and that, (3) therefore, the solution of dialyzed iron is a valuable antidote for arsenical poisoning, and should be administered promptly in cases of emergency, followed, of course, by an emetic until more efficient remedies can be used.

It, however, may readily be conceived that an antidote may be necessary in cases where the enfeebled stomach of the invalid may not be able to secrete sufficient gastric juice, even under the direct stimulus of the poison, or that the arsenic may be ingested into a stomach that is free from the presence of any gastric secretion. Now, while under these circumstances the mucous secretion might prevent absorption for a certain length of time, yet in these cases, and, indeed, we believe in *all* cases, the administration of solution of dialyzed iron as an antidote for arsenical poisoning should be immediately followed by a teaspoonful or more of sodium chloride, thus insuring the formation of ferric hydrate and the consequent neutralization of the poison.

With this addition, solution of dialyzed iron is the most convenient antidote, certainly, to be obtained, and should be kept in every well-regulated pharmacy for cases of emergency; and manufacturers should make the addition to their labels directing the additional use of this salt (sodium chloride), as through its use, while no harm can be done, many valuable lives might be saved, which, through the use of dialyzed iron alone, would possibly be sacrificed.

Since the above was in the hands of the publishers, we note a case of arsenical poisoning successfully treated by the administration of solution of dialyzed iron alone, as reported in the Philadelphia "Medical Times," Dec. 8th, pp. 104, 105. The patient, a young lady of normal health, inadvertently swallowed a considerable quantity of arsenic, which had become by accident mixed with some confectionery, and when the attending physician saw her she presented the symptoms of poisoning in a well marked degree. Solution of dialyzed iron was administered with prompt relief, yet, strange to say, this was not followed by an emetic, but the use of the dialyzed iron, continued in doses of 2 fluidrachms, largely diluted with water. The doctor notes the recovery of the patient.

The occurrence of this case and the treatment pursued, while successful, does not convince us that it would in a similar case be at all proper or justifiable to rely entirely on the solution of dialyzed iron as an efficient antidote, if not followed by the free use of sodium chloride; as we contend that where any doubt exists the patient should have the benefit of it, and, through the exhibition of other remedies, so multiply the chances of escape that death should ensue only from neglect of these.

Philadelphia, 12th mo. 15th, 1877.

ON OIL OF HEMPSEED.

BY H. BETZ.

(*Read at the Alumni Meeting, December 7.*)

This oil is obtained from the fruit of *Cannabis sativa* by expression. By means of a hydraulic press, and 2,000 pounds to the square inch, a good commercial quality of hempseed yields from 15 to 18 per cent., though according to some statements 24 to 30 per cent. can be obtained.

Oil of hempseed has a peculiar hemp odor, a sweetish, mild, oleaginous taste, deep-green color, and, if held before a flame, shows the complementary hue scarlet, if the column has fifteen sixteenths of an inch or more in diameter; at thirteen-sixteenths, it is red with a yellowish shade; at twelve-sixteenths, yellow; at ten-sixteenths, yellow with a greenish tinge; at eight-sixteenths, green with a yellowish shade, and at six-sixteenths and below it has lost this power of dichroism.

The specific gravity is 0.9319, it boils at 550°F., and from 180° gives off very disagreeable and irritating fumes. At 5°F. it acquires a

thick, honey-like consistence. Proximately, it consists of a large proportion of olein and a rather small one of stearin; its color is not extracted by cold or boiling water nor alcohol. It is insoluble in alcohol, but freely soluble in benzin, oil of turpentine, ether and olive oil. Boiled with an equal part of a solution of 18 per cent. of potash, a translucent homogenous mass or soap, of a deep-green color, is produced. The soda soap is of a lighter green color, and of a more flaky consistence.

The pure oil, I think, may be distinguished from some of the fatty oils as follows: If mixed with cocoanut oil the mixture [in which proportion?—EDITOR] will congeal at 12° above zero; if mixed with expressed oil of laurel, alcohol will extract the green color of the latter, and should castor oil be the admixture, alcohol will detect it.

NOTES ON CASUAL DRUGS.¹

BY E. M. HOLMES, F.L.S.

Occasionally drugs which have no recognized value in England are sent over on speculation from foreign countries. These find their way into the dock warehouses at the principal ports, such as London and Liverpool, and if no commercial use is discovered for them, they remain in the warehouses until the expense of housing them necessitates their sale. Such sales are known as "rummage sales" and take place periodically.

Inasmuch as the drugs thus sent to English ports are in most cases of value, or at least are thought to be so in the countries from which they are exported, a short notice of them may, perhaps, present some points of interest.

At a sale of the kind alluded to, which took place last month, the following articles were noticed:

Tamarisk Galls.—These small galls came from Mogadore. They vary in size from that of a pea to a horsebean, or more rarely reach the size of a small nut. The taste is powerfully astringent. Internally they are found to be full of small cavities, in which, however, the insect that forms them is very rarely found in a state to be examined. So far as I am aware, the name of the insect has not yet been

¹ Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, November 7, 1877.

determined. The galls contain about 40 per cent. of a very pure tannin.

In Morocco these galls are known under the name of Tacout, and are produced upon the twigs of *Tamarix articulata*, Vahl. In India, similar galls are produced upon *Tamarix Gallica*, L., and *Tamarix orientalis*, Vahl.; those of the former plant are usually rather larger, and are called Bara-mai in Hindostanee; the smaller ones, from *Tamarix orientalis*, being called Chota-mai. The Tamarisk galls of India also occasionally find their way into English commerce, and if better known would probably be largely used for tanning purposes.

A strong infusion of these galls has been recommended in India as an application to foul ulcers, and by the natives they are used in diarrhœa and dysentery.

Calophyllum inophyllum, L.—The fruits of this plant were imported from the Mauritius under the name of oil seeds. The fruits as imported consist of the hard woody endocarp. They are about the size of an English oak gall, nearly globular, with a small projecting point at one end, and contain a yellowish-white oily kernel. According to the official report of the products in the India Museum, the seeds yield 60 per cent. of a fragrant green oil, fluid at ordinary temperatures, but beginning to solidify when cooled below 50° Fahr.

In India it is used as a lamp oil and also as an outward application for rheumatism. Although apparently unknown in the commerce of this country in 1847-8, nearly 4,000 gallons of the oil were exported from Madras to Ceylon and the Straits settlements. The tree yielding these seeds bears handsome white fragrant flowers, and it may not be out of place here to remark that there is a wide field for experiment among the native plants of India for those interested in perfumery. The following note, extracted from Seemann's "Flora Vitiensis," will show how highly the oil obtained from these nuts is esteemed in Fiji, as well as the method of extraction:

"The most valuable oil produced in Fiji is that extracted from the seeds of this tree, the dilo of the natives, the tamarind of Eastern Polynesia, and the cashumpa of India. It is the bitter oil or woondel of Indian commerce. The natives use it for polishing arms and greasing their bodies, when cocoa-nut oil is not at hand. But the great reputation this oil enjoys throughout Polynesia and the East Indies rests upon its medicinal properties as a liniment in rheumatism, pains

in the joints and bruises. Its efficacy in this respect can hardly be exaggerated, and recommends it to the attention of European practitioners. The oil is kept by the Fijians in gourd flasks, and there being only a limited quantity made I was charged about sixpence per pint for it, paid in calico and cutlery. The tree is one of the most common littoral plants in the group; its round fruits, mixed with the square ones of *Barringtonia speciosa*, the pine cone-like ones of the sago palm, and the flat seeds of the walai (*Entada scandens*, Benth.), densely cover the sandy beaches. Dilo oil never congeals in the lowest temperature of the Fijis, as cocoa-nut oil does during the cool season. It is of a greenish tinge, and very little of it will impart its hue to a whole cask of cocoa nut oil. Its commercial value is only partially known in the Fijis, and was found out accidentally. Amongst the contributions in cocoa-nut oil which the natives furnish toward the support of the Wesleyan missions, some dilo oil had been poured, which on arriving at Sydney was rejected by the broker who purchased the other oil, on account of its greenish tinge and strange appearance. On being shown to others a chemist, recognizing it as the bitter oil of India, purchased it at the rate of £60 per tun, and he must have made a good profit on it, as the article fetches £90 a tun.

“In order to extract the oil the round fruit is allowed to drop in its outer fleshy covering and rot on the ground. The remaining portion, consisting of a shell somewhat of the consistency of that of a hen’s egg, and enclosing the kernel, is baked on hot stones in the same way that Polynesian meat and vegetables are. The shell is then broken, and the kernels pounded between stones. If the quantity be small, the macerated mass is placed in the fibres of the vau (*Hibiscus tiliaceus* and *tricuspis*), and forced by the hand to yield up its oily contents; if large, a rude level press is constructed by placing a boom horizontally between two cocoa-nut trees and appending to this perpendicularly the fibres of the vau. After the macerated kernels have been placed in the midst, a pole is made fast to the lower end of the fibres, and two men, taking hold of its end, twist the contrivance round and round till the oil, collecting into a wooden bowl placed underneath, has been extracted. Of course, the pressure thus brought to bear upon the pounded kernels is not sufficiently great to express the whole of the oil, and there is still much waste.”

Boomah Nuts.—These are the fruits of *Pycnocomma macrophylla*,

Benth., a small tree belonging to the *Euphorbiaceæ*. These fruits were imported from Natal under the name of galls, probably on account of their bearing a strong resemblance to Aleppo galls in shape and size. Externally they have a black color, and when broken open exhibit a hard three-celled endocarp, each cell containing a single seed. The seeds in shape and color are not unlike a castor oil seed, but are less than half the size and have no appreciable taste.

The Boomah nuts are said to be used for tanning in Natal. The tannin is contained in the outer coat, or sarcocarp, and must be very small in amount, considering the size of the fruit, since so large a portion is occupied by the woody endocarp. These nuts are not likely, therefore, to be able to compete in this country with other tanning materials.

Barosma ericifolia, Andr.—This drug is a species of buchu leaves. The leaves are very small, resembling in size and shape the leaves of the heath, whence the specific name. The odor of the leaves is powerful, but differs somewhat from that of the official species, having a slight resemblance to the odor of caraways. These leaves are used by the Hottentots in the same way as the official kind, and also as a perfume, and in the form of tincture as an application to wounds.

Empleurum serrulatum, Ait.—The leaves of this plant are mentioned in "Pharmacographia" as being offered for buchu in this country. The characters pointed out in that work render it an easy matter to distinguish it from the leaves of *Barosma serratifolia*, Willd., the species which it most closely resembles. One feature, however, not noted in that work, is very easily observed. When a leaf of *Barosma serratifolia* is held up to the light the lateral veins are seen to be much straighter, longer, and more strongly developed than in the leaves of *Empleurum serrulatum*.

Loomoonderfall.—The large fruits which bear this name were imported from Zanzibar, and are, I am told, possessed of properties similar to those of *cocculus indicus*. I have not as yet been able to ascertain the name of the tree which produces them.

Cassia Tora, L.—These seeds were imported under the name of Fantupa seed. They are about the size of an apple pip, greenish-brown, polished, pointed at one end and irregularly angular. The leaves of this plant are used in India for ringworm, and the seed of another species (*Cassia absus*, L.) has been used in purulent ophthalmia, but the object with which the seeds of *C. Tora* were sent to this country, I am not able to conjecture.—*Pharm. Journ. and Trans.*, Nov. 10.

JAVA RHUBARB.

BY PROFESSOR HUSEMANN.

Upon the Gunung Unarung and other mountains in Java there grows, at an elevation of two to four thousand feet, a species of *Rheum*, the root of which forms an article of commerce, and is used by the Javanese as a purgative under the name of "*akar kelomba*." Three varieties of this drug are met with in commerce: (1) *akar kelomba bras*, the top part of the root, with fragments of stock still adhering; (2) *akar kelomba ketan*, the middle portion of the root; and (3) *akar kelomba keteba*, the bottom portion. Of the three the second named kind is the most valuable, whilst the top portion of the root, combined with fragments of stalk, is of the least value.

A detailed description of the best kind of Java rhubarb has been given by J. H. Schmidt in the "*Tydschrift voor Nederlandse Indië*" (xvii, p. 98), according to which the root is fleshy, and long conical, or somewhat napiform. In some places it is still covered with a dark-brown rind, whilst the remainder is peeled, and appears marbled with white and red. In a transverse section the rays run from the centre to the circumference, traversing the concentric red-colored rings, and appearing to break off at the cambium, which forms a dense dark-brown, resinous looking layer, from 1.1 to 1.5 millimeter thick. The most central concentric rings are bright red and alternate with yellow ones. At the centre, in some fissures resulting from the drying, are seen some white felt-like threads, having a silky lustre; the structure of these can be recognized under the microscope. In a longitudinal section are seen in the centre the almost rectangular parenchyma cells, partially filled with chrysophanic acid. With the aid of a glass, cells containing crystals of oxalate of lime can be detected.

The Java rhubarb resembles the Chinese in smell and taste almost completely; but according to some experiments made by Dr. v. Vogel-poel its activity is one-fourth less.

In 1874, Schmidt brought under the consideration of the Dutch East Indian government the advisability of experimenting whether it was possible to increase the activity of this species of *Rheum* by cultivation, and thus to obtain a drug equal to the Chinese rhubarb, but very much lower in price. The plant appears to be very abundant in Java, and the best kind of root, the *akar kelomba ketan*, is sold there at about 1s. 8d. per kilogram. As the therapeutic value of the Chinese

rhubarb root increases, within certain limits, with the age of the plant, even if the experiment be carried out, it will be some years before the result is known, but it would be possible in this way to secure roots of one age instead of a mixture of roots of all ages, as at present.

The comparative analyses carried out by Schmidt between the official rhubarb and the best Java rhubarb show, however, some differences, and raise a doubt as to how far the Java root possesses the tonic properties of Chinese rhubarb.

In the first place, the amount of ash differs. Calcined in a platinum dish the official rhubarb gave 12.15 to 12.24 per cent. of ash; the Java root yielded 6.27 to 6.91 per cent. A more detailed representation of the proportion of the inorganic constituents is given in the following table, in which unfortunately oxalic acid does not appear, the analyst having been prevented from completing the estimation:

	Radix Rhei officinalis.	Radix Rhei Indicæ Javanicæ.
CaO,	46.80512	41.68051
MgO,	4.24359	5.26484
KO and NaO,	7.35024	16.89486
CO ₂ ,	35.34188	19.25190
SO ₃ ,	1.11452	2.82191
PO ₅ ,	5.11709	6.78689
Cl,	0.60683	2.09575
SiO ₃ ,	0.59828	1.97869
Carbon and sand,	0.76923	2.98934
	<hr/> 101.94678	<hr/> 99.76469

Schmidt has also attempted to estimate quantitatively some of the organic bodies which play a part in the therapeutic action of rhubarb; the result is shown in the following table:

	Radix Rhei officinalis. per cent.	Radix Rhei Indicæ Javanicæ. per cent.
Rheotannic acid,	2.106	0.430
Phaeoretin,	0.151	0.090
Chrysophan,	0.056	0.107
Chrysophanic acid,	4.700	1.646
Emodin,	0.580	2.000

From this it would appear that the rheotannic acid and the chrysophanic acid are present in the Java root in much smaller proportion than in the Chinese, whilst chrysophan and emodin are present in larger proportion in the Java root. Although the figures in this table cannot be taken as absolutely correct, in consequence of the great

difficulty attending the separation of the organic constituents of rhubarb, it may be assumed that to a degree it is an expression of the differences between the two kinds of rhubarb. If chrysophanic acid be the active principle, then the inferior activity of the Java root depends probably upon the smaller quantity of chrysophanic acid present in it, and the activity might have been still further reduced if it were not for the simultaneous diminution in the proportion of tannic acid, which by its antipurgative action might act antagonistically to the chrysophanic acid. Professor Husemann considers it highly probable that the relative proportions of these constituents might be altered by cultivation so as to approximate the two rhubarbs more closely.

At present no information exists in botanical literature as to the plant from which the Java rhubarb is derived. Rosenthal's "Synopsis Plantarum Diaphoricarum" does not refer to any species of rhubarb growing in Java. Still, the Dutch East Indian botanists ought not to find any difficulty in deciding how far the plant should be treated as a new species or as one of the many continental East Indian species. But certainly the investigation throws no light upon the origin of the true rhubarb root.—*Phar. Jour. and Trans.*, Oct. 27, from the *Phar. Handelsblatt*, No. 94.

VARIETIES.

Tests and Effects of Sophoria.—Dr. H. C. Wood describes this new alkaloid, obtained by him from the seeds of *Sophora speciosa*, Benth., as follows :

I obtained it of a grayish-white color, but did not succeed in crystallizing either it or its acetate. Its reactions, as far as I have examined them, are as follows (the tests were made by placing a speck of the alkaloid upon a porcelain plate and applying the reagent).

With concentrated sulphuric acid, no color.

With chromic acid and concentrated sulphuric acid, a dirty, deep purple, passing rapidly into bright green, then into blueish and finally into yellowish-brown.

With tincture of the chloride of iron, a deep, almost blood-red, after a time acquiring an orange tint.

With nitric acid, no color.

With chromic and nitric acid, a very faint, evanescent reddish color.

With nitromuriatic acid, a dirty reddish-brown.

From the solution of its acetate, compound tincture of iodine throws down a yellowish precipitate.

I have made physiological experiments with an alcoholic extract of the bean upon the lower animals sufficient to outline its general action.

In *frogs* it produces a rapid loss of reflex activity and power of voluntary movement. The loss of power is not due to any action upon the motor nerve-trunks, as after death these were found to preserve their normal susceptibility. Further, tying the sciatic artery upon one or both sides of the frog did not influence the action of the drug upon either voluntary or reflex movements. This would indicate that the poison is a spinal sedative and has little or no effect upon either motor or sensitive nerves. In all cases the heart continued beating long after the cessation of respiration.

Upon *mammals* the effect varies somewhat in accordance with the dose. An amount of the extract estimated at two grains (?) produced, in a full grown tom-cat, in one minute marked weakness in hind legs, in two minutes inability to stand, with evident effect upon the respiration, in three minutes convulsive movements with loss of consciousness, continuing with ever-increasing embarrassment of the breathing for three minutes, when all attempts at respiration ceased. The heart kept on beating for one and a half minutes longer. The pupils were unaffected at first, afterwards dilated.

In small quantity the extract produces in the cat vomiting, great muscular weakness, profound quietude, and deep sleep, lasting some hours, and ending in recovery. In dogs the symptoms were similar to those noted in cats. Death always took place through the respiration. In a single cardiac experiment the drug had no decided effect upon the blood-pressure until towards death, but appeared to accelerate the cardiac beat.—*Philada. Med. Times*, Aug. 4, 1877.

Salicylic Acid and Salicylate of Soda in the Treatment of Neuralgia. (The "Medical Record," Sept. 1, 1877).—Dr. Descroizilles has employed salicylic acid and salicylate of soda in seven cases of neuralgia with satisfactory results. The number of cases is too small to permit a judgment to be formed from them of the therapeutic value of the two drugs, but they demonstrate the advantages which the salt possesses over the acid in the treatment of this disease. All the cases were cured, but in the three cases in which the acid was administered it produced a certain amount of deafness. In two of these cases it also exerted an energetic irritant action on the mucous membranes of the digestive and respiratory tracts, and in the other it caused vertigo, general weakness and well-marked hebetude. The salt did not exert any injurious action either on the mucous membranes or on the nervous system. It was not necessary to give it in as large doses as the acid, and the cure was rapidly effected. From 1 to 5 grams of the salt were given daily, while in one of the cases treated by the acid as much as 7 grams were given in one day. In all the cases the treatment was begun with small doses (1 to 2 grams), which were increased by a gram a day until the desired effect was obtained.—*Phila. Med. Times*, Sept. 29.

Apomorphia as an Expectorant ("The Clinic," Sept. 1, 1877).—Dr. Moritz Wertner records ("Wiener Med. Presse") his experience with this agent in a large

number of cases. He employed it with both adults and children in quite minute (1-16 grain) doses, frequently repeated. He considers it a perfectly safe remedy, as he has never observed any ill effects follow its administration.—*Ibid.*

Starch-gloss was found to be made by fusing together 60 parts of paraffin with 40 parts of stearin.—*Industriebl.*

The souring of milk during thunderstorms is attributed by Dr. M. W. Iles to the formation of ozone and the production of lactic, and most probably some acetic acid. Fresh milk introduced into an eudiometer tube, together with pure oxygen gas, curdled very perceptibly after sparks of electricity from an ordinary battery and a small Ruhmkorff coil had been passed through the gas for about ten minutes.—*Chem. News*, Nov. 30.

The coloring matter of *Tagetes patula*, according to Latour and Magnier de la Source, appears to have the composition $C_{27}H_{22}O_{13}$, and while its reactions are identical with those of quercitrin, it differs from the latter in its crystalline form and solubility. The authors proposes to call it *quercetagetin*.—*Comp. Rendus*, Nov. 12.

Water as Oxidizing and Reducing Agent. By E. Erlenmeyer.—When lactic acid is heated with dilute sulphuric acid, it is resolved into aldehyd and formic acid. In this reaction the hydrogen exerts a reducing action on the carboxyl and the hydroxyl, an oxidizing action on the rest. As glycollic acid is decomposed in an analogous way, it appears possible that the lowest homologue, carbonic acid, might in a similar way yield formic acid and hydrogen dioxide, which would then be resolved into water and oxygen. This reaction explains very simply the exhalation of oxygen by plants.—*Four. Chem. Soc.*, 1877, 581, from *Deut. Chem. Ges. Ber.*

The Volatile Acids of Croton Oil. By J. Berendes (*Deut. Chem. Ges. Ber.*, x, 835-837).—Geuther and Fröhlich presume that the tiglic acid which they found in croton oil was identical with Frankland and Duppa's methylcrotonic acid. The author has confirmed this statement. Both acids form plates having a peculiar smell like that of gum benzoin, melting at 64° , and boiling at $196-197^{\circ}$. The calcium salts form small, foliated, warty masses, and contain 3 mols. of water; the barium salts are similar, but contain 4 mols. of water. The silver salts are white crystalline precipitates, and the two ethyl ethers boil at $154-156^{\circ}$. By fusing with potash the acids are resolved into acetic acid and propionic acid. Bromine converts them into a dibromovalerianic (dibromomethylethylacetic) acid, melting at $82-83^{\circ}$; and hydriodic acid forms moniodovalerianic acid, melting at 86.5° . They are not changed by the action of sodium-amalgam and water, but on heating them with hydriodic acid and phosphorus to 160° , methylethylacetic acid is formed, boiling at $173-175^{\circ}$, and yielding an amorphous barium salt.

The higher-boiling portion of the volatile acids contains small quantities of higher homologues, one of which, $C_6H_{10}O_2$, boiling at 204° , was isolated. Of volatile fatty acids the following were found: formic, acetic, isobutyric and common valeric (isopropylacetic). The calcium salt of the latter forms with calcium tiglate a molecular compound crystallizing, in long needles.—*Jour. Chem. Soc.*, Nov.

Commercial Oxalic Acid Contaminated with Sulphuric Acid. By O. Binder.—In analyzing oxalate of ammonium, the author found that it contained a large quantity of sulphuric acid. The oxalic acid used for the preparation of the former also contained sulphuric acid to the extent of 0.4 per cent. The acid was present in the free state, enclosed in the crystals, but also as acid sulphate. Wicke found the same contamination in oxalic acid in 1857.—*Jour. Chem. Soc.*, Nov. 1877, from *Zeitschr. Anal. Chem.*, xvi, 334.

Estimation of Nitrous and Nitric Acids. By G. Lunge.—1. *Estimation of Nitric Acid.*—The author finds that the estimation of nitric acid by oxidation of ferrous sulphate (Pelouze), determining the excess of the latter by permanganate, gives accurate results; he recommends adding 20 per cent. of its weight of sulphuric acid to the solution before heating with the nitrate, to facilitate the oxidation. Siewert's method, reduction in alkaline solution by zinc and iron, gives low and variable results. Hager's modification and Schulze's process are also untrustworthy.

2. *Estimation of Nitrous Acid.*—The methods were tested on a solution of pure silver nitrite in sulphuric acid. Feldhaus' permanganate method gives good results, but the standard solution must not be too strong, and the nitrite solution should be added to it, not *vice versa*, or there will be loss from the decomposition of the nitrous acid and escape of nitrogen dioxide. It is advisable to keep the solution at $40-50^\circ$, as at lower temperatures the reaction does not take place instantaneously, so that the point of decolorization cannot be so accurately observed. Gerstenhöfer's modification of the bichromate method does not give equally good results, as it is difficult to observe the exact point when all the chromate is reduced. The other processes examined, namely, Siewert's, Hart's and Crowder's, did not give accurate or constant results.

3. *Estimation of Nitrous and Nitric Acids.*—The nitrous acid in the mixture is first determined by oxidizing it to nitric acid by standard permanganate, and then the total quantity of nitric acid present in the solution is estimated by means of ferrous sulphate. The amount of nitric acid originally present is found by subtracting from the result that formed by the oxidation of the nitrous acid.

4. *Analysis of a "Nitrose."*—This "nitrose" (sulphuric acid used to absorb nitrous fumes) from a soda factory, had a density of 1.691 at 15° , and was saturated. It contained 4.13 grams N_2O_3 in 100 cc., but no nitric acid. This result differs from those obtained by Winckler, who found nitric acid present. This, however, was probably due to the analytical method employed; for Winckler added the permanganate solution to the nitrose, and experiments made by the author with a solution

of silver nitrite in sulphuric acid showed that in this case not only was nitric acid formed, but that nitrogen escapes as dioxide. It should be stated, however, that Kolbe found nitric acid in nitrose, although the nitrous acid determinations were made by adding the solution to the permanganate.—*Jour. Chem. Soc.* [Lond.], Nov., 1877, from *Deut. Chem. Ges. Ber.*, x, 1873—1076.

Determination of Nitrous Acid in Potable Waters. By R. Hercher.—Schönbein's test for nitrous acid is condemned as of little value.

Separation of iodine from an iodide—zinc iodide is the best—is recommended as a good test. The test depending upon oxidation of ferrous sulphate serves to detect 0.00025 mgm. nitrous acid in 100 cc. of water.

The amido-benzoic acid test is much less delicate than the preceding.

Of the quantitative tests for nitrous acid, the permanganate is the best, but even this is not very satisfactory.—*Jour. Chem. Soc.* [Lond.], Nov., 1877, from *Arch. Pharm.* [3], x, 436—439.

Action of Tartaric Acid on Calcium Carbonate. By B. J. Grosjean.—Both precipitated carbonate and whiting were digested in 20 parts of boiling water containing 4 pts. of tartaric acid. Neither carbonate was dissolved, even when the acid was doubled and concentrated to a syrup. But addition of water caused solution even in the cold. Thus a weak solution of tartaric acid acts better than a strong solution of *the same weight of acid* on calcium carbonate. If, however, the carbonate is treated with 20 parts of water *saturated* with tartaric acid, solution is brought about by heating, even without dilution.—*Jour. Chem. Soc.*, Nov., from *Chem. News*, xxxv, 190.

Adulteration of Santonin with Boracic Acid.—The *Lyon Medical* says that the high price of santonin has led to its adulteration with boracic acid, and that nearly 25 per cent. of the acid has been found in some parcels. The crystals of the two bear some resemblance, but it is easy to detect the fraud by exposing the article to the light for several days, when the crystals of santonin will become yellow from the formation of photo-santonin acid, whilst the other crystals will remain unchanged. Further, pure santonin burns without residuum. If the mixture be calcined and the product treated with boiling water, boracic acid crystals will be deposited on cooling. Chloroform will dissolve santonin, but not boracic acid.—*Pacif. Med. and Surg. Jour.*, November.

On the Antagonism between Nicotin and Strychnia.—Dr. Francis L. Haynes, Assistant Surgeon to the Episcopal Hospital, Philadelphia, from a number of experiments detailed in a monograph published in the Proceedings of the American Philosophical Society, January to May, 1877, draws the following inferences:

1. Strychnia and nicotin are in no degree antagonistic poisons.
2. Strychnia increases the convulsive action, and does not diminish the motor paralysis of nicotin.
3. Nicotin (even in paralyzing doses) increases the convulsive action of strychnia.
4. Both poisons cause death by paralyzing the respiratory apparatus. They may affect respiration in different ways, but the result is the same.
5. Animals may be killed by injecting together doses of the two drugs, which singly are not fatal.—*American Med. Journal*—*Fac. Med. and Surg. Jour.*, Nov.

John Broughton, the chemist of the cinchona plantations in British India, has not been heard of since undertaking a journey from Ootacamund to Madras during last year. As he was known to have a large sum of money in his possession, it is supposed that he has been waylaid and murdered.—*Dublin Med. Press and Circ.*, Nov. 14.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, Dec. 18, 1877.

The third pharmaceutical meeting of the series was held at the College Hall, President Dillwyn Parrish calling the meeting to order; the minutes of the last meeting were read and approved. The history of the origin of these meetings was briefly stated by the president: Prof. Wm. R. Fisher, in 1842, having suggested to several of the most active members of the College the great advantage that would almost certainly accrue to those attending them and to the readers of the "Journal," induced seven of them to sign a paper asking for the use of the hall and library to carry out the plan.

The following donations to the library were made by Prof. Maisch in behalf of the publishers: "Transactions of the International Medical Congress of 1876," "The Chemists' and Druggists' Diary for the year 1878" and "Farquarhson's Guide to Therapeutics." On motion of Wm. B. Webb, the Registrar of this meeting was directed to return the thanks of the meeting to the respective donors.

Chas. J. Biddle, Ph.G., read a paper upon the use of glycerin in pharmacy, which elicited some discussion and was referred to the publication committee (see page 19).

Mr. Shinn asked whether any of the members had experimented upon the removal of the *fixed oil* from *ergot* when preparing the fluid extract? In reply, Prof. Maisch stated that the fixed oil was generally acknowledged to be inert, and his rule was to remove it by filtration; the British Pharmacopœia directed it to be removed by ether, previous to preparing the extract, and very likely petroleum benzin would be found serviceable for this purpose.

Salicylate of lithia has been prescribed lately to considerable extent, and it was stated that the salt was now made by several manufacturing chemists, and that it was used as a remedy for rheumatism.

A memorandum from Hermann Betz, a member of the present class, was read in which it was stated that he had experimented upon himself with the seed of *Sophora speciosa* shown at the last meeting, by taking one-fourth of a seed in powder. He found the hard shell nearly tasteless, the kernel of a peculiar bitter taste; after an hour a slight dizziness and numbness in the spine was experienced, which, in another hour, increased to such an extent as to impair the walking, and was followed by headache and several evacuations. The headache had increased after a sleep of $2\frac{1}{2}$ hours; the temperature of the body was now 97°F ., and the pulse had decreased from 83 to 60 beats in the minute. The effects decreased very slowly and were still perceptible after 24 hours, together with the peculiar numbness in the spinal column.

Several members announced that they were unable to report at this meeting, as they had hoped, on certain subjects which had claimed their attention lately, but would endeavor to do so at the next meeting. The subjects of *new indigenous drugs*, *alteration of chloral hydrate*, and the pharmaceutic uses of *oil of benne* were mentioned; and on motion of Chas. L. Mitchell all were requested to inform the Registrar one week before each meeting of such subjects which they intend to report on or to bring up for discussion. In connection with oil of benne, it was stated that the fixed oils of mustard and cottonseeds appeared likewise to be useful for some purposes, and might be experimented with.

The meeting then adjourned.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association, Philadelphia College of Pharmacy.—The third social meeting was held Thursday, December 6, 1877, President Mattison in the chair and some sixty odd members present.

Mr. Kennedy noticed a case of the poisoning of a child, who took a half ounce of chlorate of potassium in crystals, and, despite the remedies employed, expired in great suffering. Mr. McIntyre referred to a similar case which happened sometime since in Wisconsin.

Mr. Kennedy gave a description of a drug-store in the coal regions, which he assisted in appraising. The manner of conducting the business seemed rather curious.

Mr. H. Betz read a paper on the expressed oil of hemp seed, handed to him for examination at the last meeting (see page 26).

Dr. Miller showed specimens of oils of mustard-seed and flax-seed, the latter expressed cold. The former oil is said to emulsify with aqua ammoniæ, thus being fitted for use in Linimentum ammoniæ.

Mr. Mattison read an interesting paper on the use of dialyzed iron as an antidote for arsenic (see page 23). The question of its efficacy was established, if its administration was followed by some salt which would induce the formation of the magma in the stomach. Chloride of sodium, as the most convenient, was chosen for this purpose.

Mr. Neppach, a member of the class, from Portland, Oregon, promised a paper for a future meeting on the Chinese drug-stores of the Pacific coast, and showed a specimen of Chittem or barberry bark, which was presented to the College.

Dr. Miller explained the terminations of the five Latin declensions, and showed their connection with pharmaceutical names. A table of them was placed upon the blackboard for the use of the students. The relative merits of the different systems of pronunciation was discussed, the sentiment generally being in favor of the English method, though Dr. Miller stated that the Roman was fast being adopted.

The meeting then adjourned to Thursday, January 3, 1878.

WALLACE PROCTER, *Secretary*.

Pharmaceutical Society of Great Britain.—At the pharmaceutical meeting held December 5, Mr. J. Williams read a paper on *Nitrite of Ethyl*, which he recommended to prepare by slowly passing nitrous acid gas, evolved by acting with nitric acid upon starch, into strong alcohol kept as cool as possible. When the gas ceases to be absorbed, the liquid is distilled at a very gentle temperature, and the vapors passed first through a small empty flask and then through one containing a little water, in which all the alcohol, free acid and most of the aldehyd are retained; the vapors are now passed over a strong solution of potassa contained in a third flask, whereby the remaining aldehyd is absorbed, and the gaseous nitrous ether may then be condensed in a tube placed in a freezing mixture, which must afterwards be hermetically sealed, or, preferably, conducted into a known weight of absolute alcohol, the increase in weight indicating pure nitrous ether. This solution, if containing 50 per cent. of the ether, has the spec. grav. .850; if 25 per cent., .824, and if 10 per cent., .810 spec. grav. If treated with twice the bulk of saturated solution of calcium chloride, they separate respectively 48, 23 and 5 per cent. of oily liquid by measure; a 5 per cent. solution separates only a very thin oily film. The mixing of the two liquids must be effected slowly and with care, to avoid loss of ether in consequence of the rise in temperature; a stream of cold water should be kept constantly running over the tube, and even then some loss of the very volatile ether is probably incurred. The 5 per cent. solution appears to represent the best samples of sweet spirit of nitre obtainable in the shops of London.

The author called attention to the convenience of obtaining solutions of very volatile liquids of definite strength by the method indicated, viz., by absorbing the gases in a known weight of alcohol, and mentions beside nitrite of ethyl, which boils at about 61°F., nitrite of methyl (boiling point 17°F.=12°C.) and chloride of ethyl (boiling point 12.5°C.=54.5°F.) He likewise suggested that the preparation of the pure nitrite of ethyl was the only correct method for obtaining spirit of nitre of definite strength.

Professor Attfield alluded to the difficulty in assaying spirit of nitre; in estimating its value he had found it necessary to isolate the pure nitrite of ethyl, and often from 12 to 20 fractional distillations would be necessary. The present official (British) process would yield a spirit of five per cent. strength or less; even if all the nitric acid ordered was converted into nitrite of ethyl, it would only be of 7 or 7½ per cent. strength. If aldehyd be present in the spirit, it would likewise, at least

to some extent, be separated with the nitrite of ethyl. Regarding pure nitrite of ethyl, the speaker hoped that it would not be demanded of pharmacists, and considered it extremely undesirable the public should have undiluted chemical principles of such great activity and danger placed in their hands.

Mr. R. H. Davies, in preparing nitrite of ethyl had generated nitrous acid from nitric acid and arsenic, and followed Liebig's process, of which Mr. Williams' is an improvement. He had observed a separation of about 5 per cent. from an alcoholic solution containing 10 per cent. of commercial pure aldehyd, on being treated with solution of calcium chloride.

Mr. Umney had worked with the Pharmacopœia process on a large scale, having never less than four gallons of spirit in the still, and met with no difficulty in obtaining a concentrated solution of hyponitrous ether by that process. Working with such quantities some extra attention is required to moderate the action.

Prof. Redwood had also seen the process worked for many years in quantities quite as large as those mentioned. The distillate would, with solution of calcium chloride, separate from 38 to 40 per cent. of etherial liquid, probably about one-half of which was nitrite of ethyl. He felt that the process which he had been the means of introducing, was the only known process of producing sweet spirit of nitre of a tolerably definite composition.

Mr. Williams stated that his paper referred not to spirit of nitre, but to solutions of pure nitrite of ethyl in absolute alcohol. Aldehyd usually contains acetic ether and acetone; pure aldehyd would not separate with chloride of calcium.

The color of podophyllum resin was the title of a paper presented by Dr. A. Senier and A. J. G. Lowe. The authors observed that the color of the resin is affected by the relative proportion of water, an increase of which renders it lighter and more yellowish, and that hot water darkens the resin by partial fusion. The authors found several samples to be free from alkaloid. Alum water gives a bright yellow resin and increases the ash; prepared with water or acidulated water, only 1 per cent. of ash was found; in 8 commercial samples it varied between 2 and 4 per cent. The authors conclude that the variations of shade and color do not affect the physiological activity of the resin.

Mr. Martindale thought that the part of podophyllum resin insoluble in ether was of a bright-yellow color,¹ and would partly account for the difference of color.

Mr. Harold Senier read a paper on *Rheum officinale grown in England*. The root yields a brighter powder than East Indian rhubarb and Rheum rhaponticum, and also a slightly darker infusion. By the officinal process for extract of rhubarb it yielded 25, the others 45 and 29 per cent. respectively. By rectified spirit 17, 38 and 21 per cent. of extract was obtained, and this yield is regarded as a more reliable basis for comparison. The three kinds yielded 4.66, 12.72 and 7.9 per cent. of ash. The results point to the conclusion that the root of Rheum officinale is of less commercial value than that of Rh. rhaponticum, and are what one might expect from the rapid growth of the root, this particular sample being produced in about three years. The extract was found to be decidedly cathartic in 10 grain doses.

False Angostura Bark and Brucia. By W. A. Shenstone.—The author found the

¹ This does not agree with our observation. See also "Am. Jour. Pharm.," 1877, p. 345.—EDITOR

bark (of *Strychnos nux vomica*) to contain strychnia, though only in small quantities. The following provisional process has been adopted for proving its presence in brucia: About .5 gm. of this is placed in a test-tube, with 3 or 4 cc. of 5 per cent. nitric acid, and warmed gradually by immersion in hot water; when yellow crystals of cacothelin make their appearance, potassa solution is added in excess, and the solution cooled by placing in cold water; it is then extracted by agitation with chloroform, this solution evaporated and the residue tested in the usual way. When the amount of strychnia is small, it is necessary to char the residue with sulphuric acid before testing it, as the chloroform usually extracts a small quantity of a resinous substance which masked the reaction of the strychnia. The author also observed that brucia seems to undergo alteration by heating with pure, slightly acid or alkaline water, and intends to investigate the products produced.

Russian turpentine oil was found, by Dr. W. A. Tilden, to have the spec. grav. .8682 at 15°C., to be dextrogyre and to consist of a liquid having the same composition and properties as common turpentine oil, but of a stronger action on polarized light; of a liquid having the same composition, but boiling at about 171-5°C., and of some high boiling hydrocarbons, polymeric with turpentine oil.

Oleum foliorum pini sylvestris, examined by the same author, was of .8756 spec. grav. at 12°C., to be detrogyre and to commence to boil below 100°C. It consists of a liquid boiling at 156 to 159° which is almost certainly identical with common turpentine oil; and of a liquid boiling between 171 and 176°C., which has nearly the same odor as the chief terpene of the Russian turpentine, but is levorotatory.

The use of Russian turpentine oil was recommended by Mr. A. W. Postans in liniments and other preparations in place of the common turpentine oil, on account of its agreeable, attractive and aromatic odor and its by no means unpleasant taste.

EDITORIAL DEPARTMENT.

Physicians as Dispensers, is the title of several communications which have recently appeared in the "Philadelphia Medical and Surgical Reporter," and were initiated by a communication from J. W. P. Bates, M.D., to the Medical and Surgical Society of Baltimore, published by our cotemporary, November 10. The first portion of this paper is a reproduction of the same charges against "druggists" as were preferred in the same society five years ago (see "Amer. Jour. Phar.," 1873, p. 88), with this addition, that, "if the medicine (prescribed by a physician) proves to be a very efficient combination and have some local reputation, the druggist will keep it always prepared and labeled with his own name." Further on, the "druggist" is accused of charging exorbitantly for the medicines, and the danger resulting for the general practitioner from the inroads of homeopathy are alluded to, the success of which is attributed to the pleasantness of its medicines (? Editor) and that there is no "drug bill" to pay, since the homoeopath furnishes the medicines himself. For all this Dr. Bates can see but one remedy, namely, to furnish, as far as possible his own medicines, and, to carry out this idea, suggests that the wholesale druggist manufacture all the available articles of the materia medica in mini-

mum doses, in granules. The intent and purpose of the paper is summarized in the following concluding paragraph:

To illustrate: say we have granules of a quarter of a grain of hyoscyamus, an eighth of a grain of nux vomica, half a grain of quinia, and half a grain of iron. If we wished to put up the following prescription—

R	Quiniae sulph.,	.	.	.	.	.	grs. ii
	Ferri citrat.,	.	.	.	.	.	gr. i
	Ext. hyoscyami,	.	.	.	.	.	gr. ss
	Ext. nucis vom.,	.	.	.	.	.	gr. ½

we would use four granules of the first, two of the second, two of the third and two of the fourth, put them in a powder paper, and the dose would be ready for administration. The number of granules in a dose would make no difference, and the combination would be entirely in our own hands, and could not be repeated without our knowledge and consent. The objection to this might be the cost to the physician. True, he would lose on the first prescription; instead of making a dollar, he would clear only seventy-five cents; but then we should remember that for every time it is repeated he would get the money, and not the druggist; that the paper could not be loaned to all the neighbors; that you are not telling everybody the secrets of your business as you now do; and that the satisfaction to the community would be greater, as the medicine would be at hand, and no drug bills.

Regarding the *charges* preferred against apothecaries, they must be looked upon as chronic complaints on the part of certain individuals, who delight in speaking in general terms of the usurpation and the unscrupulousness of the former, and fail to see that the shortcomings of one or a few are not chargeable to the many. That some physicians are guilty of unscrupulous and dishonest practices and of unprofessional conduct is no secret; yet who would accuse the whole profession of the offences and crimes of the minority?

Regarding the proposed *remedy*, if carried out, it would doubtless be hailed with the utmost satisfaction by the manufacturers of medicinal specialties, the number of which would still more rapidly increase than they have done in the past under the fostering care of physicians, who are following the plan now proposed to be universally extended. As to the final result we have no fear, and are convinced that the intelligent public would prefer the "drug bills" to the "dispensations of physicians." In our opinion, the surest way to secure reform is to encourage professional integrity.

Chloriastos is the name proposed by a correspondent of the "Dublin Medical Press and Circular," Oct. 17, for a saturated solution of chloride of lead, recommended by Dr. Goolden as a disinfectant. And the reason for thus baptizing the solution? Merely to secure its use!

Pharmaceutical Meetings.—Many local pharmaceutical societies in this and other countries hold meetings at regular, usually monthly, intervals, at which scientific and practical observations connected with pharmacy are discussed. Such discussions are often of considerable merit and importance, and a resumé thereof, in many cases deserves to become more widely known. Colleges of pharmacy, at which such meetings are held, are invited to send accounts thereof to the editor, for publication in the "Journal."

While these meetings give to the pharmacists an opportunity of exchanging their views on many subjects, the younger members of the profession and the students frequently profit by listening to the discussions without actively participating therein. Their opportunity for comparing notes is mostly restricted to the students' societies, of which two—a junior and a senior—have been organized at the Philadelphia College of Pharmacy, and are doubtless in existence at other institutions. More recently efforts have been made to induce these younger men to scientific researches and close observations outside of the subjects more immediately connected with their studies, such as the quarterly meetings of the Alumni Association of the New York College of Pharmacy and the monthly social and conversational meetings of the Alumni Association of the Philadelphia College of Pharmacy. We commend these meetings to all who value habits of attentive observation and recognize the importance of judicious training in such habits.

OBITUARY.

MARSHALL SPRING BIDWEIL died at Elmira, N. Y., Nov. 21, 1877, after a long illness and decline, being then in the forty-third year of his age. He was born in Toronto, Canada, but his parents moving to New York city, he was educated there and graduated at Columbia College in 1856. His health failing, he remained for ten years in the country in Western Massachusetts, and during this time, from being treated with preparations of silver, his face acquired a blueish-grey tint, which it permanently retained. In 1868 he commenced business at Sheffield, Mass., and in 1872 moved to Elmira, having purchased the store of Owen & Morse.

The deceased was a fine scholar, an upright and amiable man and a warm and devoted friend.

CATALOGUE OF THE

Class of the Philadelphia College of Pharmacy,

For the Fifty-seventh Session, 1877-8.

WITH A LIST OF THEIR PRECEPTORS AND LOCALITIES.

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Aleman, Emanuel, Alison,	Milton,	Pa.	W. C. Bakes
Allen, Alexander Bonnell,	Flemington,	N. J.	C. C. McGlaughlin, M.D.
Allen, Jno Hays, Jr.	Mountoursville,	Pa.	
Allen, Jno Reese,	Wilmington	Del.	James Kemble.
Allen, Joseph Ingersol,	Gloucester City,	N. J.	Edwin Tomlinson.
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Angier, James Watson,	Darby.	Pa.	Wardle Ellis.

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Bassett, Fenwick,	Salem,	N. J.	James T. Shinn.
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Beavis, Wm. Henry,	Cleveland,	Ohio.	Henry Mueller.
Beetem, Jacob Samuel,	Carlisle,	Pa.	S. S. Bunting.
Belleville, Allen Leslie,	Delaware City,	Del.	A. W. Test.
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Betz, Herman,	Burlington,	Iowa.	C. P. Squires & Co.
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Bicker, Francis Joseph,	Philadelphia,	Pa.	W. B. Bicker
Biddle, Richard,	Philadelphia,	Pa.	
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Bourn, Dudley Leo.	Quincy,	Ill.	Thadeus Everhard.
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Brown, Thomas Trew,	Chestertown,	Md.	Jno. Wyeth & Bro.
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Megill, Watson,	Owensboro,	Ky.	Henry Megill, M.D.
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Moffet, David	Philadelphia,	Pa.	Jno. Moffet.
Morgan, James Hamilton,	Wilmington,	Del.	
Morrison, Charles,	Shelbyville,	Ind.	Jno. H. Leefer.
Moser, Jno. Hendricks,	Norristown,	Pa.	A. R. Slemmer.
Mossberg, Jno. Frederick,	Carlstad,	Sweden.	Samuel Campbell.
Menger, Edward Frederick.	Crete,	Neb.	Alex. Kennedy.
Mullins, Michael Martin Ambrose.	Gloucester City,	N. J.	Michael Mullins.
Murray, Bayard,	Philadelphia,	Pa.	R. Shoemaker & Co.
Murray, Bernard James,	Philadelphia,	Pa.	Geo. V. Eddy.
Musser, Omar Henry,	Lancaster,	Pa.	J. T. Shinn.
Myers, Clayton Ricker,	Mount Joy,	Pa.	Thos. R. Coombe.
Neppach, Peter Frederick,	Portland,	Oregon.	S. A. Neppach.
Newcomer, Edward Jacobs.	Culpeper,	Va.	J. B. Gorrell.
Noss, Henry,	Norwich,	Conn.	R. F. W. Opperman.
Oberholtzer, Jno. Vanderslice.	Philadelphia,	Pa.	Levi Oberholtzer.
Orsell, Jacob Francis, Jr.	Conshohocken,	Pa.	James Van Court.
Ott, Emile,	Philadelphia,	Pa.	Gust. Krause.
Owens, Samuel,	Ashland,	Pa.	W. Owens, M.D.
Packer, Geo. Harmon,	Beverly,	N. J.	H. C. Van Meter.
Patterson, Wm. Renick,	Hillsborough,	Ohio.	Chas. Shivers.
Payne, Geo. Alex. Woodson.	Lynchburg,	Va.	Geo. P. Craighill & Co.
Peat, Edward,	Delphos,	Ohio.	W. C. Bakes.
Pechin, Wm. Joseph,	Philadelphia,	Pa.	F. C. Clemson.
Pennypacker, Nathan,	Chester county,	Pa.	S. Mason McCollin.
Peters, Horatio Gates,	New Oxford,	Pa.	T. V. S. Quigley, M.D.
Phillips, Thos. Jefferson Woodworth,	Deerfield,	N. J.	J. L. Bispham.
Pleibel, Frederick, Jr.	Philadelphia,	Pa.	F. Pleibel, M.D.
Plumer, Wm. S., Jr.	Columbia,	S. C.	L. T. Sillman.
Podolski, Louis Adolph.	Philadelphia,	Pa.	Geo. C. Evans.
Porter, Geo. Cooper,	Kennett Square,	Pa.	T. W. Taylor, M.D.
Porterfield, Wm. Perry,	Falling Waters,	W. Va.	H. C. Blair's Sons & Co.
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Reche, Henry Charles,	Dubuque,	Iowa.	
Reed, Willoughby Henry.	Phoenixville,	Pa.	I. M. Buckwalter.
Reeve, Walter Sharpless,	Medford,	N. J.	Henry P. Thorn.
Reichard, Chas. Wolf,	Wilkesbarre,	Pa.	Jno. Wyeth & Bro.
Reimann, George,	Buffalo,	N. Y.	L. P. Reimann.
Reinecke, Ernest Wm.	Pittsburg,	Pa.	Jos. W. Stenger.
Resag, Charles Edward.	Wilmington,	Del.	E. McNall, Jr.
Retel, Michael,	Buffalo,	N. Y.	Peter H. Davis.
Richards, Alfred Nathan,	Easton,	Pa.	Dr. J. A. Hanly.
Roberts, Charles Haines,	Atlantic City,	N. J.	Wm. Wright.
Roberts, Charles Henry,	Philadelphia,	Pa.	I. R. Landis.
Roberts, Victor Christopher,	Salem,	N. J.	Chas. W. Warrington.
Robinson, Samuel E.	McConnellsburg,	Pa.	W. D. Robinson.
Roche, Edward Manning, Jr.	Philadelphia,	Pa.	E. M. Roche.
Rosenthal, Edwin,	Philadelphia,	Pa.	
Ross, Augustus H.	Camden,	N. J.	Jas. S. Everton.
Ross, David Hambleton,	Philadelphia,	Pa.	Bullock & Crenshaw.
Saalfrank, Charles Wm.	Philadelphia,	Pa.	O. L. Coles.

<i>Matriculants.</i>	<i>Town or County.</i>	<i>State.</i>	<i>Preceptor.</i>
Sample, George Wm.	York,	Pa.	C. R. Haig.
Schandein, Harry,	Philadelphia,	Pa.	Jas. B. Weaver.
Schimminger, George Wm.	Philadelphia,	Pa.	J. W. Dallam.
Schlosser, Gerhard,	Baden,	Germany.	Wm. J. Shaeffer.
Selinger, John Anthony,	Pottstown,	Pa.	Jno Oddy, M.D.
Shull, David Franklin,	Mainfield,	Ohio.	E. M. Magill.
Siglinger, Charles Jacob,	Philadelphia,	Pa.	H. A. Godshalk.
Simpson, S. Moses,	Dayton,	Ohio.	Thomas Dover.
Sitler, Alpheus,	Harmony,	Pa.	
Slough, Chas. Edward,	Allentown,	Pa.	C. K. Christman & Co.
Smedley, Harry Leedom,	Media,	Pa.	A. H. Yarnall & Co.
Smeltzer, Jacob Daniel,	Crookskill Mills,	Pa.	P. M. Ziegler.
Smith, Augustus Swartz,	S. Bethlehem,	Pa.	Valentine H. Smith & Co.
Smith, Frank Roop,	Wilmington,	Del.	N. B. Danforth Ph.G.
Smith, George Henry,	Allentown,	Pa.	Jos B Shaw.
Smith, Wm. Harold,	Philadelphia,	Pa.	W. R. Warner & Co.
Sparks, Alfred Denney,	Smyrna,	Del.	T. M. Baldwin.
Speaks, James Mitchell,	Fort Smith,	Ark.	N. D. Woods.
Speaker, George,	Chestnut Hill,	Pa.	Wm. A. Whittem.
Spenceley, Cornelius Ederson,	Philadelphia,	Pa.	A. H. Yarnall & Co.
Spencer, Wm.	Carlisle,	Pa.	H. C. Blair's Sons.
Sprissler, Theodore Joseph,	Philadelphia,	Pa.	I. M. Thomas.
Staples, Byron, Elwood,	Jersey Shore,	Pa.	A. B. Taylor.
Starck, Albert August Gustav,	Danville,	Ill.	W. W. W. Woodbury, M.D.
Stern, Oliver Henry,	Allentown,	Pa.	W. H. Rinker.
Stevenson, Chas. R.	Atchison,	Kan.	Simonds & McConaughy.
Stites, Albert Harvey,	Millerstown,	Pa.	S. P. Thatcher.
Stollenwerk, Chas.	Greensboro,	Ala.	A. Stollenwerck.
Strickler, Jacob,	N. Bloomfield,	Pa.	M. B. Strickler, M.D.
Strunk, Samuel W.	Quakertown,	Pa.	Stephen F. Penrose.
Suess, Paul Jno.	S. Bethlehem,	Pa.	Jno. N. Shoffner.
Sweitzer, Morris Kemerer,	Bethlehem,	Pa.	S. E. R. Hassinger.
Talbot, Stephen Liversidge,	Boston,	Mass.	R. F. Fairthorne.
Thomas, Emil Conrad,	Philadelphia,	Pa.	Jno. Knorr.
Thorpe, Alexander Proudfit,	Rocky Mount,	N. C.	H. R. Thorp, M. D.
Ticcomb, Jos. Alexander,	Columbia,	Tenn.	Ticcomb & Fowler.
Trimble, Frank Fremont,	Salem,	Ohio.	R. P. Trimble.
Troll, Conrad Wm.	St. Clairsville,	Ohio.	J. B. Hoge.
Turner, Alexander,	Philadelphia,	Pa.	W. L. Turner.
Turner, Curtis Waugh,	Philadelphia,	Pa.	F. S. Boisnot.
Turner, Jno. Basketter,	Philadelphia,	Pa.	R. Reed Stewart, Ph.G.
Uhlend, Jno. Augustus,	Lebanon,	Pa.	Dr. Geo. Ross & Co.
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Vowell, Louis Sweitzer,	Washington,	Pa.	W. D. Roberts.
Wade, McClanahan,	Christiansburg,	Va.	J. E. Waddell.
Wagener, Charles Hugh,	Holmesburg,	Va.	T. C. Orth.
Wallace, Wm. Sampson,	Newark,	Ohio.	Hugh Campbell.
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Warrington, Edward,	Morristown,	N. J.	Charles Warrington.
Waterland, Samuel,	Cleveland,	Ohio.	A. Mayell.
Waterman, Henj. Carpenter,	Eugene,	Ind.	A. M. Burden, M.D.
Watson, Charles Wesley,	Cochranville,	Pa.	L. M. Pratt, M.D.
Weis, William,	Reading,	Pa.	Jules Muringer.
Wendel, William,	Frankfort,	Germany.	W. L. Wittcamp.
Werckshagen, Otto,	Philadelphia,	Pa.	C. A. Werckshagen.
Wessels, Jno. Louis,	Pittsburg,	Pa.	C. Lange.
White, Andrew Allison,	Philadelphia,	Pa.	Bullock & Crenshaw.
White, Delaware Meigs,	Wilmington,	Del.	B. Downs, M.D.
Whitehill, George Wm.	Marietta,	Pa.	Henry N. Bryan.
Whiteside, Wm. Elder,	Philadelphia,	Pa.	P. S. P. Whiteside.
Whitney, Henry Clay,	Glassborough,	N. J.	G. Krause.
Wicks, Milton Barton,	Lancaster,	Pa.	
Widdicombe, Thos. C.	Philadelphia,	Pa.	J. M. Wirgman.
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Wilson, Thomas Winfield,	Wilkesbarre,	Pa.	Thomas Hunter.
Wilson, Wm. Rufus,	Philadelphia,	Pa.	C. W. Seary, M.D.
Wingert, Joseph Vincent,	Pottsville,	Pa.	F. C. Clemson.
Wolf, Francis Xavier,	Reading,	Pa.	J. H. Stein.
Wolf, Louis,	Louisville,	Ky.	J. T. Shinn.
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Woods, Jno. Charles,	Danville,	Ill.	Jas. N. Marks.
Woolsey, Jno. Richard,	Rochester,	N. Y.	D. G. Wear, M.D.
Zagel, Max Robert,	Sheboygan,	Wis.	J. A. Heintzelman.
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Zeller, Chas. Frederick,	Philadelphia,	Pa.	Jos. P. Remington.
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THE USEFUL SPECIES OF VIBURNUM.

BY JOHN M. MAISCH.

Read at the Pharmaceutical Meeting, January 15, 1878.

The genus *Viburnum*, which belongs to the natural order Caprifoliaceæ, tribe Sambuceæ, attracted my attention more closely when, in July last, a correspondent in Georgia sent me some branches of a woody plant, stating that the specimens came from near Orange Springs, Florida, where it was regarded as possessing valuable medicinal properties as a substitute for quinia; the shrub was said to bear a small black berry, and to be called there *black haw*, but it was mentioned that it differed from what is known by the same name in other parts of the country. Although the specimen was not accompanied by flowers or fruit, its characters were such as to lead to the supposition that it might belong to the genus *Viburnum*, and this was verified by comparing it with the plants in the College herbarium, with one of which it entirely agrees.

Viburnum obovatum, *Walt.*—This species is mentioned in Gray's "Manual" and in Chapman's "Flora of the Southern United States," the latter of which describes it as a shrub or small tree, while the former states it to be a shrub 2 to 8 feet high. It occurs on river banks from Virginia to Florida and westward. The branches are opposite and covered with a thin brown or reddish-grey bark, which adheres firmly to the white wood; in the youngest branches the bark is more green, but soon becomes covered with minute brownish, corky warts, which, on becoming confluent, give the older bark a somewhat irregular striate appearance. A distinct ridge runs from the base of each petiole downward to the next internode, and may be observed, also, on somewhat older branches, but gradually becomes indistinct through the development of the surrounding corky tissue. The leaves are small,

about $\frac{1}{2}$ to 1 inch long, opposite, thick, varying in shape from broadly obovate to spatulate, obtuse at the apex, wedge-shaped at the base towards the short petiole, and on the somewhat revolute margin either entire or slightly crenate or denticulate, chiefly towards the apex. Both surfaces are smooth, the upper one being dark-green and glossy, the lower one more greyish-green and marked with numerous minute brownish dots. The inflorescence consists of small sessile three-rayed cymes, with white perfect flowers, which produce small ovoid-oblong black and one-seeded drupes. The wood is tasteless, the bark has quite a distinct bitter taste; but the bitterness of the leaves is by far more persistent. As far as may be judged from the taste, the leaves would appear to mainly possess whatever medicinal virtue may reside in the plant; how effectual they may be as an antiperiodic I am unable to say.

Viburnum prunifolium, *Lin.*—Dr. Phares, of Newtonia, Miss., in 1867, called attention to the properties of the bark of this species, ascribing to it nervine, antispasmodic, tonic, astringent and diuretic properties, and recommending it as particularly useful in preventing abortion and miscarriage. The species is a tall shrub or small tree, from 10 to 20 feet high, growing in thickets, and is readily recognized by its oval or obovate, sharply serrulate leaves, which are opposite, glossy above, about two inches long and raised upon short, slightly margined petioles. It occurs in the United States from Connecticut south to Florida and west to Mississippi, and is generally known as *black haw*, the fruit being a small edible blue-black drupe, containing a flat and smooth putamen. The leaves, like those of the allied *Vib. nudum*, *Lin.*, and its variety *cassinoides*, have occasionally been used as a substitute for tea.

Viburnum opulus, *Lin.*—This species is quite extensively distributed. It is indigenous to Canada and found in the northern United States and southward along the Alleghanies to Maryland; likewise throughout a great portion of Europe and of the northern section of Asia. In favorable localities it attains a height of 12 to 15 feet, but is more generally a lower shrub, with a grey or greyish-brown bark, broad, three-lobed, toothed or crenate leaves, and globular, acidulous bright red drupes, having a flat, smooth putamen. From the resemblance of the fruit to the cranberry, this species is known on this con-

tinent as *high cranberry* or *cranberry tree*. The shrub preferring moist locations, and the inflorescence resembling that of the elder, its popular German name is *Wasserholder* or *water elder*, *sambucus aquaticus*, under which name it was formerly officinal. A variety produced by cultivation, has all the flowers sterile and the cymes more or less globular and showy; it is known by the names of *snow-ball* and *Guelder-rose*. The indigenous species was described by Pursh as *Vib. oxycoccus* and *Vib. edule*.

The bark and flowers of the water elder were formerly employed for their supposed alterative and antispasmodic properties, the common name *cramp bark* indicating the popular estimation in which it was and is, perhaps, still held in some localities. The fruit has the general properties of acidulous fruits, and where it is frequent is sometimes used in place of the cranberry.

Other North American Species of Viburnum.—Chapman enumerates nine species as being indigenous to the Southern United States east of the Mississippi; of this number only one, *V. scabrellum*, *Tor. and Gr.*, is peculiar to that section, while the remaining eight are likewise found in the Northern States, some extending into Canada; three additional species are found in the northern section, making twelve indigenous to the United States. Aside from *V. prunifolium*, referred to before, the following are met with from the New England States southward to Florida, the last two (perhaps all three) being likewise indigenous to Canada; they are: *V. nudum*, *Lin.*, or *white-rod*; *V. dentatum*, *Lin.*, known as *arrow-wood*, and *V. acerifolium*, *Lin.*, or *dockmackie*. Their leaves have a bitter taste, while the bark is bitter and astringent. I am not aware that they are medicinally employed in any part of North America.

Exotic Species.—De Candolle's *Prodromus* enumerates altogether 47 species, besides four doubtful ones from Japan, which are insufficiently known. Deducting those which are at present regarded as mere varieties of other species, the number is reduced to about 40 species, 28 of which are exotic and distributed over Europe, the Canary Islands, Africa, Asia, the East Indian islands, the West Indies and South America. Only a few of these appear to be put to some use.

Viburnum Daburicum, *Pall.*, produces a sweet fruit, which is eaten in its native country, the eastern section of Siberia.

Viburnum Tinus, Lin., is known as *laurestine* or *bastard laurel*, the *laurier-thym* of Southern France, on account of its evergreen, glossy leaves, which are entire and slightly revolute at the margin, and hairy on the nerves beneath. It is occasionally met with in cultivation, and produces black-blue drupes, which are said to possess cathartic properties, and are, in some localities of the Mediterranean basin, employed as a remedy in dropsy.

Viburnum odoratissimum, Ker., from China, is likewise occasionally met with as an ornamental shrub; it is evergreen, and has the leaves somewhat toothed and dense cymes of white, very fragrant flowers.

Viburnum Lantana, Lin., occurs in thickets of central and southern Europe, and is known as *lithy tree* and *giddy berry* (Schwindelbeere). The grey-brown, smooth, or, when young, mealy pubescent bark has an acrid taste and produces blisters when applied to the skin in the fresh state. The leaves are oval or ovate, sharply serrate, and mealy pubescent on the lower surface, have an astringent taste, and were formerly used in diarrhœa and similar complaints. The fruit when fully ripe is black, mucilaginous, sweet and astringent, and was employed in various inflammatory diseases. The branches have been used for making pipe stems.

Chemical Investigations.—The species mentioned above comprise all, I believe, which have been more or less employed in medicine, and of those only two have been subjected to chemical investigations.

During his patient and elaborate researches on the constitution of fats, Chevreul observed in the berries of *Viburnum opulus* a volatile acid, which he recognized as identical with the phocenic acid discovered by him in the fat of the dolphin. Afterwards Dumas proved phocenic acid to be identical with valerianic acid. H. Krämer (1834) examined the volatile acid obtained from the bark of the same shrub, compared this *viburnic* with valerianic acid, and found it to differ from the latter in odor and in the characters of several salts; however, the analytical results obtained by L. von Monro (1845) appear to establish the identity of the two.

Valerianic, besides acetic and tartaric acids, was found by Enz (1863) also in the berries of *Viburnum lantana*, which contain likewise a tannin coloring iron salts green. Krämer found in the bark examined by him malic acid and tannin, giving a blue reaction with iron salts.

The bitter principle called *viburnin* was isolated by Krämer from the ethereal extract of the bark by treating it with hot water, removing the tannin from the solution by means of hide (parchment), and decolorizing afterwards with animal charcoal; the colorless liquid left on evaporation a light-yellowish mass, which yielded a nearly white powder, of neutral reaction and purely bitter taste; it was slightly soluble in water more freely in alcohol, and on incineration left a little ash.

Enz found in the fruit of the species mentioned an acrid and a neutral bitter principle, the latter being yellow, hygroscopic, readily soluble in water, and uncrystallizable, even after dialyzing it; the fruit was boiled with lime and water, the filtrate neutralized with muriatic acid and treated with animal charcoal; the latter was washed, dried and exhausted with alcohol, the solution evaporated to a syrupy consistence, deprived of the acrid principle by ether, and then evaporated.

Leo's experiments (1834) for determining the nature of the coloring matter of the fruit of *Vib. opulus*, did not yield any important results.

The remaining constituents were those very generally distributed throughout the vegetable kingdom, such as pectin, resin, fat, gum, etc. It would be of interest to ascertain the nature of the bitter principles contained in the two first-named species, both of which are indigenous to this country and called black haw.

NOTES ON A FEW AMERICAN DRUGS.

BY JOHN M. MAISCH.

(Read at the Pharmaceutical Meeting, January 15.)

Pterocaulon pycnostachyum, Ell.—An imperfect specimen of the subterraneous portion of this plant was received from 'Georgia, where it is known as *Blackroot*, and enjoys some local reputation as a valuable alterative. The plant belongs to the nat. ord. Compositæ, has a nearly simple stem, with decurrent lanceolate wavy-margined leaves, which are smooth above and densely tomentose beneath. The inflorescence is spicate, the imbricated involucrel scales are deciduous, the ray florets are white and the akenes are crowded with a long hairy pappus. The plant grows in the damp pine barrens of our Southern States, from North Carolina to Florida.

The portion used is the rhizome, which is horizontal or oblique in the ground, and when viewed from above has a compact but knotty

and somewhat contorted appearance. Its most striking peculiarity is, that on the lower side it divides into a number of closely-set tuberous branches, which are nearly perpendicular and somewhat conical, grow to the length of about an inch, and are then suddenly contracted, each into one thin, wiry rootlet of about one to two inches. The rhizome has a thin bark, which is externally of a black color, internally of a greyish-brown, and adheres but loosely to the tough wood, which is greyish or blackish-brown, and divided into numerous very narrow wedges, loosely connected by the shrunken, narrow medullary rays from which the tangential surface, after the removal of the bark, assumes a lace-like appearance. The rootlets have a similar character, only the bark is relatively thicker. The recent rhizome branches, from which over-ground stems had grown, are scarcely one-quarter inch in diameter, but on their lower surface show already the disposition of sending off the perpendicular, cylindric-conical branches described, and as the latter increase in size the stem bases become almost obsolete, and are reduced to mere scars, more or less concave. The entire rhizome is inodorous, and the wood tasteless, while the bark has a slightly acrid and peculiar bitterish taste.

“Blackroot” resembles in color the rhizomes of *Cimicifuga racemosa* and *Leptandra virginica*, both of which are easily distinguished from it by the total absence of the perpendicular tuberous branches, and more particularly the former, by its stout ascending rhizome branches and the cross-shaped disposition of the medullium of its rootlets; and the latter by the horizontal branches of the rhizome, its hard wood and rather large pentagonal or hexagonal central pith.

In regard to its medicinal properties, Dr. F. P. Porcher (“Resources of the Southern Fields and Forests,” p. 460) says that much use is made of it as an alterative, and that it is supposed to be possessed of decided value; also, that it is well known as the blackroot of the negroes, and is given in the form of decoction (how strong?) several times a day. Nothing is known of its chemical constituents.

Ledum latifolium, *Ait.*—About nine months ago specimens from a shrubby plant were received from Michigan, in the northern part of which State the Indians claim for it great healing virtues, it being regarded to possess soporific and cathartic properties, and externally used as a sovereign remedy in fever sores, bruises and rheumatism. The dry fruit capsules still attached to the plant made it not difficult

to recognize it as a member of the Ericaceæ and the above-mentioned species of *Ledum*. Subsequently, the same plant was received from Canada, with the statement that it was popularly used to some extent and considered a valuable medicine ; its supposed properties, however, were not mentioned.

The plant is known by the name of James Tea and Labrador Tea, and occurs in British North America, and in the United States, from New England to Wisconsin, and southward to the mountains of Pennsylvania. It occurs in cold bogs and damp woods, grows to the height of two to five feet, and has alternate leaves about one inch in length, somewhat aromatic when bruised, elliptical or oblong, with an entire somewhat revolute margin, dark-green and shining above, whitish beneath, and covered with a rusty wool. The small white flowers have five or sometimes six stamens, and are in umbels situated at the end of the branches ; lateral branchlets with a smooth bark, growing from the base of the umbel. The fruit forms a five-celled capsule, which splits from the base upwards, and contains many minute seeds.

In Redwood's "Supplement to the Pharmacopœia," it is stated that the leaves are used for tea, and when infused in beer render it unusually heady, producing headache, nausea, and even delirium, but have, nevertheless, been used, it is said, in tertian agues, dysentery and diarrhœa.

This little shrub is very similar to the *Ledum palustre*, Lin., which is indigenous to Northern Asia, Eastern and Northern and some parts of Central Europe, and likewise to British America. It differs from the former mainly by its linear-lanceolate leaves, the ten stamens of its flowers and its more oval capsules. It was formerly known as *Rosmarinus sylvestris*, but the leaves are readily distinguished from rosemary leaves by the dense, rusty, felt-like hairs on the lower surface. The young and fresh leaves have an agreeable aroma and a bitter and astringent taste ; the old and dry leaves are less aromatic. They have been employed in intermittent and other fevers, in cutaneous diseases, croup and other complaints.

L. latifolium has been analyzed by Bacon, but I have not been able to consult his essay. The other species has been repeatedly examined. The most complete, though now not satisfactory, analysis is by Meissner ("Berl. Jahrb.," xiii, p. 170), in which, besides the more generally distributed principles, he found notable quantities of tannin and 1.5 per

cent. of volatile oil. Rauchfuss (1796) had previously obtained 3 per cent. of volatile oil. G. W. Grassmann (1831) noticed for the first time the stearopten, which he obtained to the extent of nearly seven-tenths per cent. of the weight of the fresh plant, and which L. A. Buchner subsequently (1857) subjected to elementary analysis, and found to be a hydrate of a terpene agreeing with the formula $5C_{10}H_{16} \cdot 3H_2O$. Willigk also examined the volatile oil, and besides the stearopten, determined it to consist mostly of a hydrocarbon of the same composition as turpentine. Grassmann's ledum-camphor volatilizes readily, its vapor producing headache and vertigo.

It is not improbable that our indigenous species may contain similar principles, and, aside from the volatile oil, may possess the tonic, somewhat astringent and diuretic properties of the leaves of other ericaceæ.

Dioscorea villosa, *Lin.*—This is the only representative in the United States of the nat. ord. Dioscoreaceæ, and is known by the name of *wild yam*. A number of species of the same genus occur in the East and West Indies, the most important of which are *Dioscorea alata*, *Lin.*; the white negro yam, *D. triphylla*, *Lin.*; the buck yam, *D. trifida*, *Lin.*, or Indian yam, *D. bulbifera*, *Lin.*, the Ceylon white yam and several others comprised in *D. sativa* of *Linnaeus*. They are generally cultivated in tropical countries for their tubers, which attain a considerable size, weighing frequently thirty to forty pounds, and, though quite acrid in their fresh state, are cooked and used as food. They contain starch as their valuable constituent, which appears generally to be about 15 to 18 per cent. of the weight of the fresh tuber, but may occasionally reach 24 per cent., according to Sheir (1847), or according to Grouven (1856) fall to 8 per cent.

The rhizome of the indigenous species has a very different appearance.

The wild yam occurs throughout the United States from New England southward to Florida and westward to the Mississippi, and is quite common in the southern section. It grows in thickets in moist localities, its slender herbaceous stems running over bushes and attaining a length of 10 to 15 feet and more. The plant is diœcious, the greenish staminate flowers are in paniculate hanging bunches, the pistillate flowers in simple drooping racemes. The leaves are quite variable, frequently alternate, but sometimes opposite or even in whorls of 4 to 6; the latter appears to occur oftener in the South. The leaves are

broadly ovate, with a heart-shaped base, entire or wavy at the margin, conspicuously pointed, with 9 to 11 ribs, nearly smooth above and more or less downy but never villous beneath. The fruit forms a triangular capsule, which is conspicuously winged on the angles, and the pendulous bunches of which are quite striking and make the plant easy to identify.

The rhizome is horizontal, about one-half inch in diameter, somewhat flattened from above, repeatedly forked or branched in various directions, so that the entire rhizome covers a space 6 to 12 inches in diameter, the branches bearing a slight resemblance to ginger. Upon the upper surface at irregular distances are the circular, more or less concave scars, left by the overground stems; beneath and on the sides, at a distance of about half an inch, are the simple wiry rootlets about 2 to 4 inches long. Rhizome and rootlets are of a light or yellowish-brown color, and break with some difficulty, exhibiting a compact white tissue with numerous scattered wood bundles of a yellowish color. Odor is absent, the taste at first insipid, soon becomes strongly acid.

It is regarded to possess antispasmodic, diaphoretic, expectorant and emetic properties, and has, among other complaints, been recommended in bilious colic in the form of an infusion, made with one ounce to the pint, one-half being taken at a dose. In Virginia, and probably in other States, it is known among the negroes as *rheumatism-root*, it being considered a sure cure in that complaint.

Continued boiling impairs the acid properties of wild yam, the principle being either volatilized or altered by heat; it has not been investigated. The rhizome contains also a considerable proportion of starch.

THE BEDFORD SPRINGS.

BY HENRY G. DEBRUNNER, Chemist.

1. *Bedford Mineral Springs.*—The water of this spring possesses a strictly saline character; it is perfectly clear, inodorous and of a slightly saline taste. Its reaction on litmus is neutral. One liter, evaporated to dryness on the water bath, gave 3.2592 grams of residue. Another sample, taken personally by Mr. James Park, Jr., left 3.2552 grams of saline residue per liter, the weight of which decreased on subsequent ignition to 2.5675 grams, or .25675 per cent. of ignited saline matter.¹

¹ This loss on ignition is due to the elimination of crystal water on heating.

The temperature of the spring has been found 58°F ., while that of the surrounding air was 70°F . Specific gravity, 1.0035. 10,000 parts of this water contain the following quantities of constituents :

Chloride of sodium, NaCl ,	0.0978
Sulphate of sodium, Na_2SO_4 ,	3.5982
Sulphate of magnesium, MgSO_4 ,	5.4810
Sulphate of calcium, CaSO_4 ,	15.1971
Carbonate of calcium, CaCO_3 ,	1.2556
Carbonate of strontium, SrCO_3 ,	trace
Alumina, Al_2O_3 ,	trace
Iron,	none
Organic matter,	none
Water, H_2O ,	9974.3703

10000.0000

Free carbonic acid, 0.42 parts, equal to 21.3 cc. per liter (32°F ., 760 mm. Hg).

Combined carbonic acid,	0.5525	} in 10,000 parts
Semi-combined carbonic acid,	0.5525	
Total carbonic acid,	1.105	} in 10,000 parts
Total Chlorine, Cl ,	0.0593	
Total sulphuric acid, SO_3 ,	14.6142	" "
Total sodium, Na ,	1.2041	" "

The saline compounds were calculated from the data obtained as follows :

Cl as NaCl .

(Total Na) minus (Na of NaCl) as Na_2SO_4 .

MgO as MgSO_4 .

(Total SO_3) minus (SO_3 of Na_2SO_4 and MgSO_4) as CaSO_4 .

(Total CaO) minus (CaO of CaSO_4) as CaCO_3 .

The latter result was confirmed by a direct estimation of CO_2 in the dry residue.

The water was also examined for the following constituents, which, however, were found to be absent, viz. : sulphur, ammonia, phosphoric acid, arsenic, nitric acid, potassa, lithia, iodine and bromine.

Quantity taken for analysis, ten liters. I add an analysis of the same water, made in 1825 by Dr. Church, of Pittsburgh, Pa.

One quart contains :

	According to Dr. Church, 1825.	H. G. Debrunner, 1877.
Sulphate magnesium,	20 grains	9 $\frac{3}{4}$ grains
Sulphate calcium,	3 $\frac{1}{2}$	26 $\frac{1}{2}$
Chloride sodium,	2 $\frac{1}{2}$	1
Chloride calcium, (?)		none
Carbonate iron,	1	none
Carbonate calcium,	2	2 $\frac{1}{2}$
Sulphate sodium,	none	6 $\frac{1}{2}$
Loss,		...
Residue on evaporation,	3 $\frac{1}{2}$	44 $\frac{1}{2}$
Specific gravity,	1.029	1.0035

In comparing these two analyses, which differ so essentially in quality and quantity of the constituents, it must be remembered that it is possible—though not very probable—that the composition of a mineral spring may become essentially different in the course of half a century. The water on its way through the earth will extract the soluble matter of the rocks or strata it meets, and, after exhausting them, obtain its mineral constituents from other, may be different, rocks it may come in contact with on its subterranean journey. This may explain the difference in our results; one statement, however, is decidedly incorrect in Dr. Church's analysis, namely, the presence of calcium chloride, as, according to the well-established laws of chemistry, calcium chloride cannot exist in an aqueous solution in presence of an excess of sulphate of magnesium. If a solution of calcic chloride is added to magnesium sulphate, the acids will change places, forming gypsum, calcic sulphate and magnesium chloride: $\text{CaCl}_2 + \text{MgSO}_4 = \text{CaSO}_4 + \text{MgCl}_2$.

However, it must be borne in mind that in 1825 chemistry, and particularly analytical investigations, had not yet reached so high a degree of perfection as now-a-days, where it ranks among the most exact of the exact sciences. Since gasometric estimations, and even spectrum analysis, have found their way into the laboratory of the "practical chemist," it is quite excusable if an analysis of fifty years ago does not correctly correspond with one made in our days.

II. *The Bedford Sulphur Spring.*—The water of this spring in many respects resembles that of the former one, with the sole exception that it contains sulphhydric acid, or sulphuretted hydrogen, the solid mineral constituents being exactly the same. It is perfectly clear, strongly exhibiting the smell of rotten eggs, and contains besides sulphuretted hydrogen and carbonic acid, gypsum—the chief constituent—sulphate of magnesium, carbonate of calcium, sulphate and chloride of sodium, traces of alumina, and no iron. On standing, it soon loses the odor of sulphuretted hydrogen and deposits a fine white precipitate of sulphur. One liter leaves on evaporation on the water bath 2·6792 grams, which on ignition give 2·0475 grams, equal ·20475 per cent. of saline matter.

As to the medical qualities of these springs, I am indebted to my friend Franklin N. Staub, M. D., for the following notes on this subject:

"The waters of the Bedford Springs have been extensively used for many years and are regarded by many as efficacious in the treatment of a considerable number of chronic diseases, where almost generally the effects of mineral waters are more particularly noticeable. Gout and the different forms of rheumatism, essentially depending, as they do, upon an abnormal composition of the blood, are perhaps the two diseases most benefitted by the use of mineral waters, of course not without some special exceptions. The cure of dyspepsia may also be powerfully assisted by the use of such waters, especially those cases in which constipation and cardialgia are marked symptoms. Much advantage is also derived by dyspeptics by a sojourn, under agreeable circumstances, at a pleasant watering place. Indeed, it is frequently difficult to determine which has exerted the greatest influence, the use of the waters or the change of diet and habits, together with the renewed hopes of improvement and cure. Functional derangements of the liver are sometimes benefitted by the catharsis produced.

"The preceding remarks refer more particularly to the effects of the water of the so-called Bedford Mineral Spring.

"The water of the Bedford Sulphur Spring differs chiefly from that of the mineral spring in containing sulphuretted hydrogen. Its medical properties are, to some extent, identical with those of the mineral spring. Sulphurous waters have been greatly extolled in the treatment of various chronic skin diseases, especially the squamæ (both simple and venereal), the itch, the various forms of eczema, etc. Especially are its effects more marked when accompanied by frequent baths in the water, the temperature of which has been elevated to about 150°F."

Black Diamond Steel Works, Pittsburgh, Dec. 21, 1877.

SOME ANALYSES OF DIALYZED IRON.

BY HENRY TRIMBLE, PH.G.

(*Read at Alumni Social Meeting, January 3, 1878.*)

No pharmaceutical preparation of recent times has met with such universal favor as dialyzed iron. The physician employs it with marked success, and the pharmacist refers to it as a type of the so-called elegant remedies to which he has of late years directed a great part of his energy. So far it has chiefly been prepared by a few wholesale manufacturers, who are constantly calling attention to its strength,

purity and general superiority over the other iron compounds. Fearing that the strength of the solution might be sacrificed somewhat in attaining the much-desired elegance, I procured of the leading manufacturers of Philadelphia six samples, and estimated the iron and chlorine by the following process.

About five grams of the solution were taken, diluted with water, treated with ammoniac hydrate and heated gently until all the iron was precipitated. This was then filtered off, washed thoroughly, ignited, and weighed as Fe_2O_3 . The filtrate and washings were heated to expel excess of ammonia, and treated with hydric and argentic nitrates. The mixture was heated and agitated until the resulting argentic chloride cohered, then filtered and the collected precipitate washed, ignited and weighed as AgCl , from which the percentage of chlorine was calculated.

The following table, containing a summary of the analyses, explains itself:

	Per cent. Fe_2O_3 .	Per cent. Cl.	Per cent. of the salt.	Formula.
I.	3.143	.140	3.192	$29\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.
II.	3.442	.154	3.497	$29\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.
III.	2.394	.156	2.514	$19\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.
IV.	2.583	.286	2.804	$11\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.
V.	4.677	.198	4.831	$31\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.
VI.	2.874	.235	3.058	$16\text{Fe}_2\text{O}_3 \cdot \text{Fe}_2\text{Cl}_6$.

There would be no criticism to offer on these results, were it not for the fact that the circulars of these manufacturers state that the solutions contain five per cent. of ferric oxychloride, or, as one asserts, of ferric oxide free from hydric chloride, both of which statements are incorrect, and as yet the latter has proved impossible.

Finally, we see that only the manufacturers are at fault, and that a solution of dialyzed iron can be and is prepared, which, compared with the iron, contains a much smaller proportion of chlorine than has heretofore been supposed, three of the samples showing this, the only objection to them being that they contain too large a percentage of water.

A COMPARATIVE TEST of SOME ANTI-FERMENTS.

BY RICH. V. MATTISON, PH.G.

Read at the Alumni Meeting, January 3.

On the 8th day of November last, thirteen new bottles were taken, and in each of them was placed 100 cubic centimeters of a strong infusion of malted barley, the following quantities of anti-ferments added and the bottles placed at a constant temperature of 76°F. To bottle marked *A* nothing was added; to the others as follows:

Schering's Salicylic Acid.			Benzoic Acid from Benzoin.			Calcium Bisulphate.		
<i>B</i>	3	centigrams	<i>F</i>	3	centigrams	<i>J</i>	3	centigrams
<i>C</i>	6	"	<i>G</i>	6	"	<i>K</i>	6	"
<i>D</i>	9	"	<i>H</i>	9	"	<i>L</i>	9	"
<i>E</i>	12	"	<i>I</i>	12	"	<i>M</i>	12	"

At the expiration of twenty-four hours these solutions were examined with the following result:

A had fermented and tasted quite sour, but at this period no froth or "barm" was to be seen upon the surface of the liquid. The microscope showed the presence of *bacteria* in large numbers and numerous very small cells of the *Saccharomyces Cerevisiæ*. *B*, *C*, *D*, *E*, *H*, *I* and *M* showed only bacteria in slightly varying quantity, but no cells could be observed, and there was no evidence of fermentative change, while in *F* there were numerous small cells observed, with bacteria present, and the liquid was slightly sour to the taste. *G* contained bacteria, was very slightly sour and a few hyaline cells were observed. *J* was quite sour, had large numbers of bacteria and cells, the latter very small. *K*, *L* were very slightly sour, contained few bacteria and very few minute cells.

No "barm" or froth was to be seen upon either of the solutions, and at the expiration of twenty-four hours they were again examined.

A large quantity of froth appeared by this time on the surfaces of *A*, *B*, *C*, *D*, *E*, *J*, *K*, *L*, *M*, they had each deposited a considerable precipitate and were all decidedly sour and in active fermentation. The cells of the *Saccharomyces* were of large size and in countless numbers; these large cells were exceedingly prolific, giving off, by budding, myriads of smaller cells, many of which were arranged in chains like the beads of a necklace, and many of these smaller cells just escaping from the maternal cell, were observed to be throwing out their minute buds—even before they had entirely separated from the parent cell.

The form and appearance of the cells of these solutions, with one exception (*E*) were such as characterized those of *Saccharomyces Cerevisiæ*, while in *E* the cells more closely resembled those of *Saccharomyces Mycoderma* as did the method of budding also. Still, it could scarcely be this plant as the liquid certainly was in the flood tide of active fermentation. No difference was observed in the appearance of the surface or the sedimentary ferments, excepting in the former the budding seemed more rapid. *F, G, H, I*, upon examination, proved to be all slightly sour; no appearance of froth, however, being seen. Under the microscope were to be seen a few fresh, plump cells, and a few larger withered cells, while these liquids had also grown muddy in appearance from the production of fresh cells.

At the expiration of twenty-four hours the solutions were again examined.

A, B, C, D, E, J, K, L, M were quite sour; they were covered with froth and rapidly proliferating cells, while bubbles of carbon dioxide could be seen to constantly rise to the surface of the liquid. In *J, K, L, M* the deep brown color had been reduced to a yellowish-white through the action of the dissengaged sulphurous acid from the calcium bisulphite; *F, G, H, I* were scarcely changed. They were rather more sour than at the previous examination and although full of bacteria, there were very few cells to be seen, and those few were very small and shriveled in appearance. Another marked difference between these four solutions containing the benzoic acid is in the fact that no froth is formed on these, while in the others the froth is from one-eighth to one-fourth the depth of the liquids.

In this series of experiments, therefore, the benzoic acid, while not entirely preventing fermentation, had a very much more marked influence in arresting and aborting this change than did either the calcium bisulphite or salicylic acid.

A further experiment is in progress upon solutions of cane sugar in the form of dilute syrups. We have nothing to report excepting that the unprotected sample has developed a large amount of a confervoid growth, the striæ consisting of rods of simple elongated cells, with no appearance of fermentation, while the samples protected by either salicylic or benzoic acid are at the present writing unchanged.

TINCTURE OF CANTHARIDES.

BY GEO. W. KENNEDY, PH.G.

The time is fast approaching for the National Convention for Revising the Pharmacopœia to assemble in the city of Washington, D. C., on the first Wednesday in May, 1880.

By reference to the various pharmaceutical journals, I notice that committees have been appointed from several of the medical and pharmaceutical colleges and associations for the purpose of preparing a list of drugs and chemicals used in their respective localities, and also to furnish the best working formulas for the large number of tinctures, syrups, solid and fluid extracts, and other pharmaceutical preparations in general use.

The time intervening before the assembling of the final committee is but two years, and it is absolutely necessary for the many workers to commence the labor assigned them at once. I observe that many committees have organized, and are pushing their work forward favorably. Judging from the material composing the committees, there is no doubt but their work will be done well and in a systematic order.

It is likewise the duty of all pharmacists, no matter whether serving on committees or otherwise, if they have any suggestions or recommendations to make in the direction of improvement of pharmacopœia processes or formulas, to report the same, either to one of the many committees or through some pharmaceutical journal.

The object of the writer of this article is to recommend a change in the menstruum used in the preparation of tincture of Spanish fly. There is no doubt but all pharmacists are cognizant that diluted alcohol is the menstruum directed to be used by our present Pharmacopœia. I find, after experimenting, that alcohol is preferable to diluted alcohol, for the following reasons:

1st, because diluted alcohol does not dissolve the cantharidin, the active and vesicating principle of the drug, so well as alcohol. The writer, to satisfy his curiosity, collected and preserved the dregs after making several quantities of the tincture as now prepared by the U. S. Pharmacopœia, dried them, and in a percolator submitted them to the action of alcohol until completely exhausted. The alcoholic tincture was evaporated on a water-bath to about the consistence of simple cerate, a small plaster was made and applied, which, in the course of an hour, produced redness of the skin,

and in three hours blistered it, thus proving conclusively and satisfactorily that a change can be made advantageously as recommended.

2d. The tincture as prepared according to the present directions is objectionable, on account of its inelegant appearance and the precipitation which takes place shortly after being prepared ; it is decidedly displeasing to the eye, and does not present that beautiful clear greenish-yellow color as when prepared with alcohol. In our days of advancement in elegant pharmaceutical preparations, we should endeavor to manufacture handsome-looking products, so long as the medicinal qualities of the drug are not impaired.

3d. As tincture of cantharides is one of the ingredients of the many hair tonics and dressings which pharmacists are often called upon to prepare, it is also preferable on account of the solubility of the castor oil which frequently enters into preparations of this kind, producing and furnishing to the customer a much handsomer compound.

The German Pharmacopœia directs to prepare the tincture by macerating cantharides, 1 part, with alcohol sp. gr. 0·832, 10 parts, for eight days, and filtering.

SAPO VIRIDIS.

BY HERMAN BETZ.

Read at the Alumni Meeting, January 3.

This preparation is used to some extent in Europe, and many pharmacists here are obliged to keep it for their customers, who make use of it in itch and allied affections, for which it is by some considered quite an efficacious remedy.

As found in the market, it is often very impure, being prepared from common animal fats and colored with various substances. Animal fats are not advisable for this purpose, but any vegetable fatty oil, such as oil of hemp or linseed can be very properly used. In countries where oil of hempseed is a common article of commerce, green soap is usually made from this oil, and is obtained of a nice dark-green color.

One reason why green soap in this country is so often adulterated may be found in the scarcity and high price of oil of hempseed. Oil of linseed has the same properties in making a soap for the purpose before mentioned, and on account of its cheapness would not offer so

much temptation for adulteration; it would be advisable to use it altogether, when we would always have a uniform and reliable preparation. As it is now, one can hardly find two samples alike.

In making green soap, one or two points have to be taken in consideration. In the first place the color; this green color is one of the most difficult to obtain from vegetables. I have made a number of experiments, and found none to answer so well as the green coloring matter precipitated from a solution of indigo by lime.

Another point is the disagreeable odor which green soap usually has, but this is easily overcome by a few drops of essential oil, for instance, the oil of citronella.

The following formula may be found useful in preparing this soap:

Take of Oil of linseed, U. S. P.,	.	.	.	.
Solution of potassa,	.	.	.	āā Oi
Coloring matter,	.	.	.	q. s.
Oil of citronella,	.	.	.	gtts. x

Place the oil and potassa in a porcelain dish; mix thoroughly and boil with a regulated heat until the mass becomes thick or stringy; then add the coloring matter and the oil of citronella, with constant stirring.

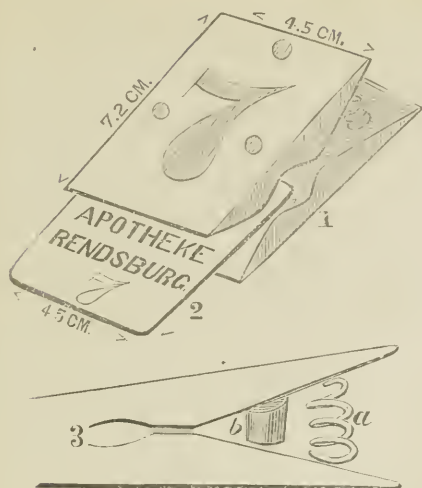
If the oil is perfectly saponified the mass must be homogenous and transparent; opaqueness may be due to want of water, or to an excess of fat, or of solution of potassa. The first and the last can be remedied by a small quantity of water, and if the proportion of oil was too large, an addition of solution of potassa will render the mixture clear.

PREScription CLAMPS.

Editor American Journal of Pharmacy:

I have read with interest, in the October number of the JOURNAL, the article by Mr. Andrew Blair on the dispensing of prescriptions. Permit me to communicate to you a contrivance which, about a year ago, I published in the "*Pharmaceutische Zeitung*," and which, I am pleased to say, seems to have found great favor in Germany, but has been probably overlooked by you.

My little apparatus will be easily understood from the accompanying sketch. These prescription clamps (No. 1) are marked with a large figure and if not in use, contain a check with the same figure and with



the name of the firm. as shown in the cut No. 2. The checks are made of sheet iron, with the figure and firm name engraved thereon. The clamp works by means of two spiral springs, 3a, between which is placed a piece of cork, b, to prevent too strong a pressure. A person coming with a prescription receives a check, and the prescription is placed in the corresponding clamp. If the medicine is called for,

the check is demanded, and in this way mistakes are prevented and much unnecessary questioning of the customer saved, who sometimes declines giving his name. Remarks like "paid," "half the quantity," etc. are written upon the prescription, a corner of which is bent for the purpose.

I have no doubt that this cheap and very useful contrivance (I have 24 such clamps in use) will also find favor in your country, and I should be pleased if you would bring this communication to the notice of your readers. I remain, etc.

H. E. SCHELENZ.

Rendsburg, Germany, Nov. 23, 1877.

DISPENSING DANGEROUS COMPOUNDS.

As druggists are occasionally required to compound and dispense chemical compounds of an explosive character, they are usually educated as to their nature, and cautioned as to their manipulation. Notwithstanding this, we occasionally note accidents as occurring from such mixtures, and as the recital of a case may prove a useful lesson, and tend to prevent the repetition of the error, the following instance is mentioned:

A physician sent to a druggist a prescription for nitro muriatic acid and tincture of cardamom. The druggist, after compounding the formula, handed the bottle to the messenger, who was in the act of

placing it in the pocket of his overcoat, when the vial exploded, to the injury of his clothing and to his great alarm. The contents of the bottle being thus lost, the druggist re-compounded the prescription, cautioning the bearer not to shake it. After his recent experience the messenger carried it very cautiously to the patient, who, on removing the wrapper, was met by an explosion that drove the vial cork violently against the eyeball, and scattered the fumes and acid over her face. Prompt surgical assistance fortunately saved the eyesight of the patient, but only after several days' suffering and anxiety.

We are not informed whether the druggist dispensed, as he should have done, nitro-muriatic acid—previously mixed—*after* re-action had taken place, or whether he mixed the acids and bottled them without waiting for the re-action; but we presume, from the imperfect history given, that the latter was the fact, and to recall to others the dangers of such a course we desire to record the case.

Wood, in his "Therapeutics and Pharmacology," says, "care should be taken in opening the bottle to avoid exposing the face to the jet of gaseous vapor which sometimes suddenly escapes, especially when the bottle has been kept in a warm place, and which may endanger the eyes if not guarded,"¹ and we regard the physician, who directs the administration of such a remedy as derelict to his duty when he does not duly caution his patient against such an accident.

X. Y. Z.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

The Turpentine Oils.—Dr. Godeffroy gives the following characteristics of the various oils of turpentine met with in the European market:

Austrian oil of turpentine, from *Pinus austriaca*, transparent, colorless or slightly yellowish, sp. grav. .864; boiling point, 155—157°C.; turns polarized light to the left.

German oil of turpentine, from *Pinus sylvestris*, *P. abies*, *P. vulgaris*, *P. picea* and *P. rotundata*, resembles the former; sp. grav. .86—.87; boiling point, 155—160°C.; levogyre.

French oil of turpentine, from the turpentine of *Pinus maritima*, color-

¹Wood Therapeutics, vol. i p. 381, 1856.

less or faint yellowish, sp. gr. .86; boiling point, 156—157°C.; lævogyre; odor peculiar, taste burning. French turpentine is chiefly produced in the neighborhood of Bordeaux, and yields 25 per cent. oil.

Venetian oil of turpentine, from Venice turpentine of *Larix decidua*, is lævogyre, and resembles the preceding, but has a more agreeable odor. Venice turpentine is mostly obtained in Southern Tyrol and in Piedmont, and yields 18—25 per cent. of oil.

English oil of turpentine, from American turpentine of *Pinus palustris* and *P. Tæda*, resembles the French, has the sp. grav. .864, boils at 156—157, and is dextrogyre. American turpentine yields about 17 per cent. of oil.

Besides these four principal varieties, the following are likewise met with:

Pine cone oil, oleum *Abietis pini*, is obtained by distilling with water the cones of *Abies pectinata*. It has a much finer odor than oil of turpentine, spec. grav. .868; boiling point, 160—162°C., and is dextrogyre.

Dwarf pine oil (Krummholz—or Latschen oil), oleum *Pini pumilionis*, is obtained by distilling the young tops and cones of *Pinus pumilio* with water. It has a peculiar odor, reminding of juniper, sp. grav. .865; boiling point, 170°C., and is lævogyre.

Pine leaf oil is obtained on distilling the leaves of *Pinus sylvestris* or *P. Abies* by means of steam. It has a very fine aromatic odor, spec. grav. .876; boiling point, 160°C., and is dextrogyre.

Templin oil (also Kienöl, Germ.) is obtained chiefly in some sections of Switzerland and Tyrol by distilling the wood, branches, leaves, cones, etc., with water. It has a lemon-like odor, spec. grav. .86—.88; boiling point, 160—164°C., and is lævogyre.—*Phar. Zeitung*, 1877, No. 81—*Zeitschr. Oest. Apoth. Ver.*

New Method of Extracting Scammony Resin. Emile Perret. —The author exhausts the crude pulverized scammony with boiling alcohol, and neutralizes the dark alkaline liquid with a few drops of sulphuric acid. The coloring matters are precipitated as a lake, and the clear supernatant liquid is filtered off; the alcohol is distilled off, and the residual pure resin is dried on the sand-bath, raising the temperature gradually to 104°.—*Chem. News* [Lond.], Dec. 21, 1877.

Process for Extracting Quinidia from the Quinoidin of Com-

merce. Dr. J. E. de Vry.—The hydrochloric solution of quinoidin is heated in the water-bath, and mixed with a solution of caustic soda (containing 40 grms. hydrate of soda per liter) to remove a black resinous matter. From the solution remaining the quinidia is separated, either by means of tartaric acid, or of potassium iodide. The author remarks that all the neutral salts of the cinchona alkaloids have an alkaline reaction.—*Ibid.*

Sanguinaire or the arabe.—John R. Jackson has examined this tea, which is put up in Algeria, and is recommended in colds, catarrhs and chest affections; likewise as being useful in alleviating fevers, and in contributing to the enrichment of the blood. It was found to consist of the flower-heads and large silvery bracts of *Paronychia argentea* and *nivea*. The infusion had scarcely any color, very little smell, and reminded rather of boiled hay.—*Phar. Jour. and Trans.*, Jan. 5, 1878.

Fraudulent Quinia.—Dr. Pratesi reports on a chemical product, said to be of German origin, and offered as adapted for the fraudulent substitution of quinia. It resembles quinia sulphate in appearance and in the behavior to alcohol, ether, chloroform and ammonia, but is freely soluble in water, not precipitated by barium chloride, not persistently bitter, and when heated upon platinum foil burns, giving off violet vapors.—*Pharm. Zeitung*, Dec. 5, from *Ann. di Chimica*.

Detection of Small Quantities of Morphia.—The suspected substance is dissolved in concentrated muriatic acid, to which a small quantity of pure sulphuric acid is added, and the solution evaporated at 100° to 120°C. A purple coloration is observed, even in the presence of substances which are readily carbonized. After the evaporation of the hydrochloric acid, a fresh portion of it is added, and then some sodium bicarbonate, when a violet coloration is produced which is unalterable in contact with the air and yields nothing to ether. On the addition of a few drops of a concentrated solution of iodine in hydriodic acid, the violet color passes into green, and the compound is soluble in ether with a purple color. This reaction is due to the formation of apomorphia. Codeia gives the same reaction, but can be separated from the morphia by ether.

Brucia treated in the same manner gives, on neutralization with the sodium salt, a blue coloration, passing into red on the addition of iodine; but this reaction is not very delicate.—G. Pellagri, in *Ber. d. deutsch. Chem. Ges.*, from *Phar. Cent. Halle*, 1877, No. 47.

Bitter Almonds.—The physiological investigations of Portes lead to the following results: 1. The developing bitter almonds contain amygdalin. 2. Their composition always differs from that of sweet almonds. 3. The embryo contains the emulsin. 4. The amygdalin, whose origin is still unknown, appears first in the integuments of the seeds; and 5, passes gradually through the radicle into the cotyledons. —*Compt. Rend.*, lxxxv, 81.

The Volatile Acids of Croton Oil.—Besides stearic, palmitic, lauric and myristic acids, Schlippe had proven the presence of oleic, crotonic and angelic acids, and Geuther and Fröhlich had observed in the mother-liquor of croton oil soap the presence of acetic, butyric, valerianic and tiglinic acids, regarding the latter as being probably identical with the methylcrotonic acid of Frankland and Duppa. This identity has now been proven by E. Schmidt and J. Berendes.—*Phar. Cent. Halle*, 1877, No. 38.

Copper in Olive Oil.—To detect copper in artificially colored olive oil, C. Cailletet advises to agitate 10 cc. of the oil with a solution of 0.1 pyrogallie acid in 5 cc. of ether. The presence of copper is indicated by a brown coloration.—*Ibid.*, No. 46.

Calomel in Corrosive Sublimate.—Mich. Schlesinger has repeatedly observed that commercial corrosive sublimate would not completely dissolve in water, but left a residue of calomel, which in one case amounted to .54 per cent.—*Phar. Cent. Halle*, 1877, No. 43.

[We have not unfrequently met with the same impurity in the corrosive sublimate of our commerce.—EDITOR.]

Solid Sulphuric Acid.—The chemical works of Stark, in Bohemia, have brought into the market the anhydrid of sulphuric acid, which is put up in soldered boxes of tinned sheet-iron. At the ordinary temperature, and when moisture is totally excluded, anhydrous sulphuric acid does not act upon metals, and, more particularly, upon zinc. In this condition the acid is particularly useful for the preparation of alizarin.—*Ibid.*, No. 45.

Arsenical Capping Paper.—J. B. Barnes directs attention to a magenta colored capping paper, which contains notable quantities of arsenic, and the color of which has evidently been prepared by oxidiz-

ing anilin by means of arsenic acid. The bare suspicion of extraneous arsenic finding its way into *medicine* must be sufficient to insure its instant abandonment by those who have not already suspected that the paper contains arsenic.—*Phar. Jour. and Trans.*, Oct. 27.

Syrupus Ferri Phosphatis cum Quinia et Strychnia.—After reviewing the literature on this preparation, and noticing the defects of the different formulas proposed for its preparation, Geo. Masson proposes the following, by which a colorless syrup may be readily obtained, of full strength and good keeping qualities.¹

The syrup should be preserved from the air in bottles, well-filled and securely stoppered :

R	Strychniæ,	.	.	.	24 grs.	
	Quiniæ sulph.,	.	.	.	860 grs.	
	Ferri sulph.,	.	.	.	4 ozs.	40 grs.
	Sodæ phosph.,	.	.	.	12 ozs	} Avoirdupois.
	Sacchari purif. contus.,	.	.	.	60 ozs.	
	Acid. phosph. dil.,	.	.	.	48 ozs.	

Dissolve the quiniæ sulph. in aq. dest., with a sufficiency of acid. sulph. dil., precipitate with liq. ammon. q. s., collect on a filter, wash carefully, avoiding the use of too much water, and add to the acid. phosph. dil. in which the strychnia has been previously dissolved. Dissolve the ferri sulph. in Oil, and the sodæ phosph. in Ov of recently-boiled distilled water, filter the iron solution if necessary to remove any oxidation, allow the solutions to cool to 130°F., and then add very gradually, with constant stirring, the solution of soda to the iron; allow the precipitate to subside, remove the supernatant fluid and wash the ferrous phosphate by decantation with recently-boiled distilled water, then transfer to a calico filter, express quickly the remaining liquid, and dissolve in the dilute phosphoric acid. Finally, add the sugar, dissolve without heat, and subsequently add a sufficiency of distilled water to make the product measure 96 fluidounces, each fluidrachm of which will contain 1 grain phosphate of iron, 1 grain phosphate of quinia, and one thirty-secondth grain of strychnia.—*Phar. Jour. and Trans.*, Dec. 22.

¹ Weights and measures of the British Pharmacopœia.—EDITOR.

PILLS AND PILL COATINGS.

BY CHARLES SYMES, PH.D.

Read before the Liverpool Chemists' Association, November 22, 1877.

The pilular form of medicine is one which has received considerable attention at the hands of pharmacists, and so much has already been written and said concerning it that a difficulty presents itself to me in bringing the subject forward to offer much that is really original; I can, however, give some of the results of my experience, record and estimate certain known facts as they appear to me of more or less value, and thus submit my views of the matter which might not be uninteresting, inasmuch as we know by daily experience that just as the same ray of light falling on different bodies is either absorbed, transmitted or reflected, and these in different degrees, so the same phenomenon impinging on different minds is differently received and produces a different impression, or, as we commonly say, is seen from different points of view.

The pill is a concentrated and portable form of medicine and often contains ingredients which would be exceedingly nauseous if taken in a liquid state; it requires no measuring out of dose and is thus exceedingly convenient; we cannot, therefore, be surprised that it has become very popular, and that the skill of the pharmacist has been taxed to its utmost to bring into this form a large variety of substances, to enhance its keeping qualities by every conceivable means, and to cover it in a manner which at once renders it both elegant and tasteless. The first operation in the production of pills is of course that of weighing out the ingredients. I mention this because I fear it is not always as carefully done as it might be; often the same balances are used to weigh one grain and one hundred. Now as the knife edges will necessarily become somewhat blunted by these heavier weights, their delicacy will become impaired and they will thus be rendered unsuitable for weighing small quantities of active substances. For these I prefer the German balances with graduated beam and sliding weight or rider, capable of weighing from one tenth to five or ten grains *and not more*; then for larger quantities or less potent substances the ordinary dispensing balance weighing from a few grains to one hundred; and for anything above this quantity a small well made pair of counter scales should be used. These latter will of course only be required when the patient wants a large supply, or for the manufacture of stock pills.

Sometimes the ingredients of a formula will, when mixed, themselves form a mass suitable for dividing into pills ; but usually an excipient has to be added, and the proper selection of a suitable one constitutes the chief art in pill making. The list of excipients is somewhat lengthy in detail, but they may be summarized as follows : Glycerin of tragacanth, glycerin, treacle, syrup, mucilage, tinctures, spirit, water, confections, extracts ; powders of tragacanth, gum arabic, taraxacum root, bees'-wax, almond meal, soap, bread crumb, etc. Mr. Martindale has recommended a mixture of starch and glycerin, and Mr. Walter Searle a solution of soluble cream of tartar and citrate of potassa, to which is added syrup and mucilage. Whatever be the ingredients or the excipients, it should be borne in mind that to attain satisfactory results a pill must resemble a building and contain constituents possessing the physical characteristics of both bricks and mortar ; these too, if possible, in such proportions as to produce a substantial structure.

Of the soft or plastic excipients in the foregoing list, glycerin of tragacanth is probably the most generally useful, as by means of it in small quantity we are enabled to get sufficient adhesiveness to bring solid particles, themselves devoid of that property, into a compact mass, and cause them to cohere firmly together without imparting undue hardness or insolubility. Metallic oxides and salts are by it rendered most tractable, and a pill which would otherwise be very large is by it rendered quite within the average size. I produce samples of pills containing five grains bromide of potassium, and ten grains of subnitrate of bismuth respectively, neither of which are larger than a five grain colocynth pill. Glycerin itself, except in very small quantity, is not a good excipient though frequently prescribed ; pills containing it are liable to absorb moisture and become sticky ; they also do not take silver well when required so to do. Pills prepared with mucilage are liable to become very hard when kept for any length of time ; with spirit they require to be rolled off quickly or will become brittle and crumble on the machine. Spirit should never be used when there is much resin in the pill, indeed with this, as with the other liquid excipients named, most pharmacists will have ascertained the special cases to which they are best adapted as the result of experience. Of the extracts that of liquorice is about the most useful, as it possesses no active medicinal properties ; confection of roses and that of hips usually

tend to increase the bulk of the mass rather more than is desirable, otherwise they possess good combining properties. It not unfrequently happens that the ingredients of a prescription, instead of requiring moisture, have in themselves too little solidity to form or retain the pilular consistence; we have, as it were, all mortar and no bricks wherewith to build. In such cases Mr. Proctor strongly recommends the addition of powdered wood; he compares a pill to an animal, and says this substance is real bone to it, which, doubtless is the case; but in the face of the satire on the apothecary and his sawdust pills, I have never been able to reconcile my mind to its use.

If the mass require but a small addition in the way of solidity and some elasticity, then a little powdered tragacanth answers admirably, but if the quantity be too great then the elasticity is also excessive and it becomes somewhat difficult to round off the angles under the pill finisher. If the mass is much too soft, and consists chiefly of moist extracts, the first thing to be done is to dispel some of the moisture by the judicious application of heat (for this purpose a very small hot-water plate is an acquisition to the dispensing counter), a little of some powder, such as tragacanth, gum arabic, liquorice root, or taraxacum might then be worked in, and the mass be rolled out quickly before it has thoroughly cooled. If the extract possess a hygroscopic nature, such as that of dandelion, then tragacanth, which tends to dryness, answers well. But what I believe to be still better in the case of extracts which are not injured by drying is to use them in powder.

Pills containing much essential oil are best manipulated by the addition of a few shreds of wax and a little powdered soap where not incompatible; this combination enables the operator to get in more oil, carbolic acid, creasote, etc., in a satisfactory manner than any other means I am acquainted with. Almond meal has also been recommended for causing oily and watery substances to unite; it does so by its emulsifying properties and would be very valuable but, unfortunately, it gives an insoluble character to the pill and thus impairs its activity. An excipient formerly much prescribed, but about the worst I know of, is crumb of bread.

Some substances require special excipients. I will only mention two of these—sulphate of quinia might be made into pills with confection of hips; better, because smaller, with glycerin of tragacanth; but, best and smallest with tartaric acid (about two grains to twenty) and a

single drop of water. Camphor and extract of henbane usually form a very refractory mass, breaking and crumbling on the machine; if, however, the camphor is powdered by the addition of a little *water* instead of *spirit*, all difficulty disappears, the mass retains its plastic condition for some time, and might be rolled out with perfect ease.

Whatever means are used for the formation of pills, they should, when finished, be perfectly spherical and present a smooth, firm surface; this is essential, not only for the sake of appearance, but for the proper performance of the second operation, viz., that of coating them.

Reading a short extract from the "United States Dispensatory," of 1833, will prove that even America, which has gone ahead so rapidly in pill coating as in most other things, contemplated nothing of the kind in those days. The method of covering pills with powders as there described was that which obtained in this country during my early initiation into the art and science of pharmacy some twenty years or more ago; indeed, it is still practised in many, if not most pharmacies in the present day, a little of the powder also being placed in the box to keep the pills at a respectful distance from each other. The first improvement on this with which I became acquainted was that adopted by myself in 1860; possibly the same or similar methods might have been in use at the same time by others, but as far as myself was concerned, it was original (at least as original as ideas ever are), and very simple too. It consisted in utilizing a waste product, viz., the resin left after preparing syrup of tolu; this, dissolved in ether, preferably with a sp. gr. of .717 or .720, formed a varnish in which the pills were rolled and whilst still moist were transferred to a box containing finely powdered French chalk, then turned on to a warm pill tray and kept rotating for a short time; finally they were polished *with slight* pressure under the pill finisher. Pills so prepared possess a steel grey appearance and smooth surface, though not the egg-shell white character now given them; but this method of procedure or some modification of it is the first part of the process adopted for accomplishing the latter.

The pills are now placed in a covered pot as at first, and are moistened with syrup, mucilage or a mixture of the two; when evenly covered they are transferred to a box containing French chalk, or a mixture of it and finely powdered sugar, well shaken and again transferred to a warm pill tray, kept rapidly rotating until dry and smooth; the operation taking but a comparatively short time. Well covered in

this way they will keep good for years. I have a specimen of some pills thus coated more than four years since ; on cutting them open they will be found less hard then they would have become in as many weeks if left exposed as these have been and uncoated.

There is a drawback to this covering in the case of pills containing essential oils ; the oil dissolves some of the coloring matter of the pill, and takes it through the coating which then becomes yellow or brown and unsightly. Manufacturers of these pills on the large scale usually get over this difficulty by substituting gingerine for any essential oil in the formula, but such a procedure is inadmissible in dispensing.

Under these circumstances the covering recommended by M. Caloud ("Journal de Pharmacie," xxiii, 310) might be used with advantage ; it consists of a powder prepared as follows :

One part of powdered tragacanth mixed with two of water is pressed through muslin ; this is then mixed with twenty parts powdered sugar of milk and spread on a procelain slab in a thin layer to dry ; lastly, it is reduced to a fine powder. This is not easily accomplished, but I have found by experience that the excellence of this coating largely depends on the fineness of the powder. The pills are merely moistened with water and rolled in the powder, keeping up a rotary motion till dry, and repeating the operation if necessary.

Pills of this kind also do well with gelatin coating, one of the oldest methods, and one which is now seldom used in this country, but the Americans still adopt it to some extent, and one house in New York advertises somewhat extensively a full line of gelatin-coated pills. The process is exceedingly simple, but like all others requires some amount of practice and dexterity for its successful accomplishment. The only necessary apparatus consists of a pin board, *i. e.*, a piece of wood into which pins have been pressed, so as to allow the points to project a good distance above the surface, and a small vessel of melted gelatin. I generally use the French sheet gelatin—say four parts, water sixteen, glycerin one. The points of the pins should be slightly greased before placing the pills on them, and any scum or skin should be removed from the solution before dipping them ; when removed a rotary motion with occasional inversion is kept up till the gelatin has set, they are then put aside to dry. In the "Pharmacist" (March, 1877) Mr. Charles B. Allaire describes an ingenious little apparatus, which can be readily constructed for coating pills with

gelatin. A second piece of wood, the same size as the pin board, is so hollowed out in small hemispherical depressions as that one pill in each hollow corresponds with each pin in the pin board; this is for the convenience of picking up a quantity at once. When dry, the whole are removed at once by a kind of comb with long teeth made to slide between the pins.

According to the tabulated results of a number of experiments by Mr. J. P. Remington (*"Amer. Journ. Pharm."*) gelatin coating is not readily soluble, but the solvent used was only water, and even so could not apply to the coating containing glycerin. By a similar means Hawker's patent jujubes are covered, and I have never heard a customer complain of any difficulty in removing the coating; it appears to be readily soluble in the mouth.

Mr. E. K. Durden proposes (in the journal just quoted) to cover pills with collodion having a sp. gr. .810; two dippings in this are said to give an elegant appearance; it is readily put on and completely conceals the taste of the medicine. Valerianate of zinc pills so coated, which is about as severe a test as we can apply, stands it moderately well. It remains, however, to be proved how far this coating is soluble in the stomach.

We now come to sugar coating. This process is conducted by manufacturers, especially in America, on an extensive scale, and seems daily to be gaining favor from the profession, the pharmacist, and the public. It possesses the advantages of a pleasant taste and ready solubility, and whilst there might be some doubt on the part of the patient as to the prudence of frequently swallowing pearl coating there certainly could be none on the part of the most fastidious as to taking a small quantity of sugar. This coating varies somewhat, however, and the purest sugar is not always used to produce the whitest coating; still it might be done without any admixture.

Numerous inquiries have been made of late as to the exact process to be adopted for satisfactorily accomplishing this object, the usual reply being, "Follow the practice of the confectioner in the production of his confits," about which I may add there is but one secret. The process is simply this: pills well dried on the surface are introduced into a tinned copper bowl with a flat bottom, or enameled iron dish, the surface of which has been moistened with syrup or with syrup and gum; they are then rotated and gently heated, very finely powdered sugar is dusted on,

and the motion kept up until a perfectly dry, hard and whitish coating is obtained, the operation being repeated till the desired result is accomplished—which with the pharmacist in his first attempt *is usually not the case.*

But now for the secret. We have followed the method of the confectioner in its outline ; but what about his skill and experience ? These are just the things wanting ; the confectioner would be a very clumsy hand at producing the pill, the pharmacist is usually equally so at sugar-coating it ; the confectioner could be educated to make the pill and the pharmacist to coat it with sugar if he would only apply his ability, gain experience by perseverance, and keep up by practice his acquired knowledge. A gentleman writing to the "Pharmaceutical Journal" a short time since, complained of what he considered to be want of courtesy on the part of certain Americans respecting a little apparatus for sugar-coating small quantities of pills. The truth is, I believe, that the said apparatus is to be found in every pharmacy ; it is simply the knowledge of how to use it that is not.¹

Lastly, we have silvering as an elegant coating readily applied. It is mentioned in the old "United States Dispensatory" as a thing of the past, but is frequently used in the present day. I need say little or nothing about its application. Avoid the use of glycerin as an excipient in the pill, put as little moisture on the surface as will enable the silver to adhere, and burnish by rotating in a covered pot containing a little cotton wool to remove any loosely attached fragments of silver leaf.—*Pharm. Jour. and Trans.*, Dec. 15, 1877.

NOTE ON THE "SAPONIN" OF SARSAPARILLA.

BY PROFESSOR FLÜCKIGER.²

Galileo Pallotta was the first chemist who attempted the separation of an active principle from sarsaparilla. His work appears to have been done early in the present century, shortly after the discovery of the first alkaloids. By treating the aqueous extract of the root with milk of lime, drying the precipitate, and boiling the alcohol, he obtained a substance that he claimed to be an alkaloid and named

¹In the "Amer. Jour. Pharm.," May, 1867, there is an article by Mr. H. C. Archibald, on "Sugar Coated Pills."

²Abstract of article in the "Archiv der Pharmacie," 3d series, vol. vii, p. 532.

"pariglina," or "parillina"; it is difficult, however, from Pallotta's meagre description¹ to form an idea of the properties of this body. According to a note in the "Pharmaceutische Zeitung," of the 2d of May last, Dr. Pallotta, who is a Professor of Natural Science at Naples, is still of opinion that in his pariglina he discovered an alkaloid. Whether or not it was a more or less pure form of the constituent of sarsaparilla hereafter referred to, Professor Flückiger considers that Pallotta's name, parillin, should be retained for the special crystallizable body found in that root. Subsequent investigators called this body "smilacin," by which name it has gradually become generally known. That both alkaline and acid properties should have been attributed to this substance by various authors was due, probably to the presence of impurities, which, however, are easily removed by recrystallization. Parillin is decidedly a neutral body. Strangely, it is occasionally confused with a body yet uninvestigated, probably a steroptene, said to occur in the root of *Hemidesmus indicus*, R. B., which has been called Indian sarsaparilla, although it does not resemble the *Smilax* root.

In 1859, O. Gmelin stated that parillin is decomposed by acids into sugar and a substance insoluble in water, a statement that has been questioned by others. Some experiments carried out in the author's laboratory by Klunge also pointed to the glucoside nature of parillin; but doubt was not altogether dispelled, because the unaltered parillin itself reduces alkaline cupric tartrate, though very slightly. For these reasons Professor Flückiger considered an examination of parillin desirable, in order at least to ascertain whether it was a glucoside. Meanwhile, this point was decided last year by Otten,² who, however, looks

¹ "Journal de Pharmacie," x, 543.

² "Vergleichende histologische Untersuchung der Sarsaparillen aus der pharmacognostischen Sammlung des pharmaceutischen Instituts zu Dorpat, nebst einem Beitrage zur chemischen Kenntniss dieser Droge." Dorpat, 1876. In the latter part of this exhaustive treatise, which is too long for insertion entire in this journal, and unsuited for abstraction, Herr Otten identifies a second substance present in sarsaparilla with saponin, and from his experiments arrives at the conclusion that parillin has an action similar to, but not so strong as that of saponin, and that it is sapogenin plus sugar. Dragendorff has already pointed out that saponin and senegin affect the heart's action more energetically when impure than pure, and Otten suggests that the action of these allied bodies, as well as of parillin, is dependent upon another body always occurring together with them.—ED. PHARM. JOURN.

to Professor Flückiger to carry on the investigation. Professor Flückiger suggests that, in order to facilitate a comparison of the nearly allied, if not identical, substances, saponin and parillin, a more exact investigation of the former, prepared from cheaper materials, should be undertaken by others, he himself dealing with the sarsaparilla "saponin" or parillin.

The following method of preparation is recommended as preferable to that given in "Pharmacographia." The chopped and bruised sarsaparilla root is heated at least twice with alcohol of about 0·835 sp. gr., the liquid poured off and the marc pressed, and the product distilled until the residue in the retort equals one sixth, or rather less, of the weight of root used. The liquid, which is strongly colored, but not particularly thick, is diluted gradually with one and a half times its weight of water, which causes the formation of a light yellowish loamy precipitate of crude parillin. The liquor is allowed to stand some days in the cold, after which the very dark brown clear liquor can be decanted off. With the deposit is then mixed about half its volume of alcohol, the mixture is filtered, and the precipitate washed with very dilute spirit, containing about twenty to thirty per cent. by weight of alcohol. This operation depends upon parillin being less soluble in dilute spirit than in ordinary alcohol or in water, it being precipitated from an alcoholic solution by the addition of water, or from an aqueous solution by the addition of spirit. In alcohol of sp. gr. 0·835 it is freely soluble. Although freely soluble in boiling water, and very slightly soluble in cold water, it crystallizes best from alcohol. Prepared in this way, after treatment with animal charcoal, the parillin is obtained pure white, either in thin scales or prisms, showing a double refraction in polarized light.

In several experiments with different kinds of sarsaparilla, working with about 4 kilograms of root, the author obtained about 0·18 to 0·19 per cent. of pure white crystallized parillin. Some more parillin can be obtained by concentrating the mother-liquor and precipitating with a little water, or boiling it with alcohol. This second yield, however, is less readily purified, it becoming mixed with sodium chloride, which occurs plentifully in all aqueous extracts of sarsaparilla. The author failed to obtain parillin from the root stock of *Smilax aspera* or from China root, but the quantity operated on was small. Marquis reports ("Archiv d. Pharm.," ccvi, 342) that he obtained 1·75 per cent. from sarsaparilla, 5·12 per cent. from *Smilax aspera*, and over 0·60 per cent. from China root.

Air-dried parillin contains water of crystallization, which it loses at 100°C.; but different experiments gave results varying from 6 to 12 per cent. At about 140° it cakes together, melts with partial decomposition at about 210°, and acquires a strong brown color by further heating. Melted parillin readily takes fire, and burns quietly after the

removal of the flame, but it is difficult to effect a perfect combustion of the light charcoal at first produced. Pure crystallized parillin is almost insoluble (about 1 in 10,000) in cold water, but a solution prepared with boiling water remains supersaturated after it has become cold. It dissolves at 25°C. in 25 parts of alcohol, sp. gr. 0.814, and much more freely in boiling alcohol, crystals separating from the latter on cooling. Parillin dissolves in warm chloroform to a thin liquid which cannot be filtered, and yields upon evaporation no crystals, but only an amorphous varnish, which, however, can be recrystallized from hot alcohol.

Parillin does not seem to be provocative of sneezing, like saponin from quillaia, cyclamen and other sources is. Solid parillin has not an acrid taste; an alcoholic solution has more acidity than an aqueous solution, but, incomparably less than saponin solution. No effects were observed to follow the use of such solutions of parillin. Parillin in alcoholic solution has no rotatory action and does not color litmus paper.

Parillin gives with strong sulphuric acid a pure yellow solution that becomes of a beautiful cherry-red at the edges, due to dehydration. With dilute sulphuric acid (10 per cent.) it becomes greenish when heated; kept in a water-bath it gradually becomes a beautiful red and finally brown. Phosphoric acid acts similarly, but gives more of a yellow-green color. The addition of nitric acid, nitrates or bromine to the sulphuric acid solution produces no special color.

An aqueous solution of parillin gives with an alcoholic, but not with an aqueous solution of acetate of lead, a precipitate again soluble in excess of the lead salt or of alcohol. No precipitate is produced by subacetate of lead or tannic acid. In the cold a solution of parillin does not reduce alkaline cupric tartrate, but at 80° or 90° a separation of cuprous oxide takes place in a few hours. But it produces no separation of metallic bismuth from a solution of bismuth tartrate in caustic alkali even after prolonged heating in a water bath. Boiled with dilute sulphuric or hydrochloric acid, and the filtrate neutralized, it freely reduces cupric tartrate in the cold after a short time, and with the least warmth immediately. It is, therefore, evident that parillin is a glucoside.

The parigenin produced by the decomposition of parillin with dilute mineral acids is perfectly insoluble in boiling water, so that it can be readily separated and washed. It is probable that the sugar separated is at least partially crystallizable.

During the decomposition of the parillin by dilute mineral acids the liquid acquires a strong green fluorescence. The fluorescence is still more marked when parillin in solution in chloroform containing alcohol is decomposed with dry hydrochloric acid gas. This liquid is at first colorless, and does not develop heat, but suddenly becomes brown by transmitted light and full green by reflected light. Upon the addition

of water, or evaporation of the alcohol and chloroform, white flocks of parigenin are formed whilst sugar remains in the solution. As in similar cases the fluorescence of parillin is very persistent. An unweighable quantity heated with a few drops of strong sulphuric acid in a water-bath gives a liquid that can be diluted with 100 cc. of acid without losing its fluorescence, but dilution with water causes its immediate disappearance. After saturation with ammonia the liquid does not again show the green shade. In this behavior and the color parillin gives with a little sulphuric acid in the cold lie the best means at present known for its detection. It is noticeable that the "saponin" of digitalis, to be presently mentioned, Schmiedeberg's digitonin, also gives this fluorescence, but not cyclamin. Three analyses of parillin (smilacin) given in Gmelin on the authority of Henry, Peterson and Poggiale, agree fairly well with the figures obtained by Klunge in two analyses. But Professor Flückiger believes that these specimens were contaminated with parigenin. Parillin dissolved in warm water, which does not take up parigenin, filtered, and reprecipitated by alcohol, gave between 2 and 3 per cent. less carbon, or as a mean of three analyses, $C=60.4$; $H=9$. Three other analyses of another sample gave the following figures, showing still less carbon:

C	.	.	.	57.66	56.80	56.4
H	.	.	.	—	8.27	8.3

These figures appear to show a remarkable relation between parillin and the saponin prepared by Rochleder, Schwarz and von Payr from the "soap-root" erroneously attributed to *Gypsophila Struthium*, which had the formula $C_{64}H_{106}O_{36}$. If this formula be written $C_{32}H_{53}O_{18}$, the next lower in a homologous series of "saponins" would have the formula $C_{31}H_{51}O_{18}$. Possibly this is the place of the "saponin" found by Schmiedeberg in commercial digitalin, and named "digitonin"; he, however, attributed to it the formula $C_{31}H_{52}O_{17}$. Should there really be a homologous series of "saponins," the eighth step upwards from Rochleder's saponin would be the compound $C_{32}H_{53}O_{18}+8CH_2=C_{40}H_{69}O_{18}$. This would require 57.3 per cent. of carbon, and 8.2 per cent. of hydrogen, figures not irreconcilable with those obtained in the last three analyses of parillin, whilst the mean of the previous three analyses would agree with the formula of a saponin $C_{32}H_{53}O_{18}+16CH_2=C_{48}H_{85}O_{18}$, which would require 60.7 per cent. of carbon and 9 per cent. of hydrogen. Subsequently, however, Rochleder has published the formula $C_{32}H_{54}O_{18}$ for his saponin, which agrees better with the results of its decomposition, and also pretty closely with the saponin prepared by Christophsohn from Levant soap root, quillaia bark, *Saponaria officinalis* and *Agrostemma* seeds, which he believes to be identical as obtained from all four sources. As, however, this would only slightly alter the hydrogen, it is not inconsistent with the homologous nature of the "saponins." From these and other considerations it appears probable that there exists a series of saponins with the general formula $C_n H_{2n-10} O_{18}$.

Sapogenin and parigenin produced, with sugar, when saponin and parillin are split up under the influence of acids, are closely allied, as is also cyclamiretin resulting from the decomposition of cyclamin, and possibly they are also homologous.—*Pharm. Jour. and Trans.* [Lond.], Dec. 23, 1877.

TEST FOR SANTONIN.

BY DAVID LINDO.

Place the santonin in a small deep porcelain dish, and dissolve it (without heat) in concentrated sulphuric acid; rubbing the crystals down with a glass rod greatly facilitates solution. Add highly dilute solution of ferric chloride in small quantities at a time, and between each addition give the dish a pretty quick rotatory motion while it is supported on a table. A fine red color is first developed, which changes to a magnificent purple, and then to a splendid violet as the sulphuric acid becomes more dilute. The heat produced by mixing the fluids is necessary to develop the colors.

When applying the test to small quantities of santonin, a somewhat different method of proceeding must be adopted. The experiment in this case is best performed in a one-inch shallow porcelain capsule, with a thick, flat bottom. Mix the highly dilute solution of perchloride of iron with an equal bulk of concentrated sulphuric acid, and add the mixture to the santonin. Heat must then be cautiously applied. The crystals of santonin will slowly dissolve, and the color will be developed.

The capsule is conveniently supported on the blade of a spatula, and heated by a spirit lamp.

One drop of a solution of 1 grain of santonin in 1 fluidounce of chloroform was evaporated to dryness in a small capsule, and the residue heated with a drop of the perchloride of iron and sulphuric acid mixture. A very fine reaction was obtained.

The separation of santonin, however, from other organic matters would, in most cases, be very difficult, and, in many instances, an impossible thing to accomplish, owing to the facility with which it suffers decomposition.

In trying the experiment of separating santonin, by means of chloroform, from a powder containing rhubarb and santonin, I noticed a thing which I have not seen mentioned before. The chloroform separated from the powder by filtration was evaporated to dryness, and the residue tested for santonin. The violet color was obtained very distinctly. I then tried the effect of the test fluid on the coloring matter of rhubarb alone, as I noticed this is dissolved by chloroform. The test produced a reddish color, not the violet or purple color of santonin.

Thinking that in the case of rhubarb the iron had nothing to do with the reaction, I next tried the effect of *concentrated sulphuric acid alone* on the coloring matter of rhubarb. I found it produced a beautiful

scarlet color: this is much the same effect (as is very well known) produced by alkalies on the coloring matter; and when the latter has been turned red by an alkali an acid restores it to yellow.—*Chem. News*, Nov. 16.

Falmouth, Jamaica, Oct. 6, 1877.

MINUTES OF THE COLLEGE.

PHILADELPHIA, Twelfth month 31st, 1877.

A Stated Meeting of the Philadelphia College of Pharmacy was held this day at the Hall of the College, No. 145 North Tenth street.

Dillwyn Parrish, President, in the chair; eighteen members in attendance.

The minutes of the meeting in September last were read and on motion approved.

The minutes of the Board of Trustees for the last three months were read by the Secretary of the Board, and on motion adopted.

These minutes show that the Board has appointed Thomas S. Wiegand Actuary of the College, who will be in attendance daily during the Lectures from 3 to 5 and from 6 to 10 o'clock P. M., to discharge the duties of Librarian, Curator, etc.

A report of a committee appointed by the Board to adopt a By-Law specifying the duties of the Actuary, and which had been referred to the College for its action, was read and laid over under the rules for consideration at the meeting in March next.

William C. Bakes, Secretary of the Pharmacopœia Committee, stated that the committee had entered upon their duties and that they had met jointly with similar committees of the Philadelphia County Medical Society, and the College of Physicians of Philadelphia; that work had been laid out and arranged for the sub-committees, and would be attended to in due season.

Then adjourned.

WILLIAM J. JENKS, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 15, 1878.

The fourth pharmaceutical meeting of the series was held this day at the College hall, President Dillwyn Parrish calling the meeting to order. The minutes of the last meeting were read and approved.

Mr. A. P. Brown presented a copy of the Proceedings of the New Jersey Pharmaceutical Association, and Prof. J. M. Maisch, on behalf of the American Pharmaceutical Association, presented a copy of the Twenty-fifth Annual Report of their Proceedings, also the Year-Book of Pharmacy, from the British Pharmaceutical Conference.

On motion, the Registrar was directed to return thanks for said donations to the different bodies and preserve the volumes in the library.

Professor Maisch called the attention of the meeting to the black root of Georgia (*Pterocaulon pycnostachyum*, Ell.), James' tea (*Ledum latifolium*, Lin.), the rheumatism root of Virginia (*Dioscorea villosa*, Lin.), the black haw of Florida (*Viburnum obovatum*, Walt.), specimens of which plants and drugs were exhibited to illustrate two papers read by him, entitled "Notes on a Few American Drugs" (see

page 53) and "The Useful Species of *Viburnum*" (see page 53); the papers were referred to the Publication Committee.

Mr. E. M. Boring exhibited a plant used by an empiric in the cure of cancer; it was recognized by Professor Maisch as *Ceanothus Americanus*, *Lin.*, and is called American tea, New Jersey tea, or red root, because that is the color of the root. It was made use of largely during the American Revolution, by our ancestors, in place of the true tea. Some time during the years 1863 or 1864 some enterprising individual, who had become familiar with the manner of preparing and drying tea in China, commenced the trade of packing this in a similar manner, at the same time circulating through the newspapers that the *tea* plant grew largely in certain sections of our country; for a time the trader prospered, but, as it was not *tea*, it soon fell into disuse.

The subject of the *impurities in chloral hydrate* was mentioned at the last meeting, and was now called up, and discussed by Messrs. Boring, Maisch and others.

Mr. Boring stated that he had mentioned the subject at the last meeting in order that the members would give it some of their attention, and that we could compare notes at this one. His attention was directed to the subject by a paper of Professor Liebreich, which stated that only such chloral should be used as was in crystals and perfectly dry. He stated that all the crystal chloral in our market adhered to the side of the bottle, but that one sample gave no evidence of uncombined chlorine, while in another the evidence was decided; both samples reddened moistened litmus paper suspended in the bottles. He had no trouble with it practically, had had no complaints, but wanted to be sure that he was dispensing an article that came up to the standard of the authorities on the subject. If they give a false standard, from improper motives, they should be exposed.

Prof. Maisch remarked that of late years he had not had much practical experience with chloral; but from earlier experiments he was convinced that the shape of the crystals was no criterion of its purity, that pure chloral hydrate had a slight acid reaction, and that the density of the white vapors produced with a glass rod moistened with ammonia was largely influenced by the temperature. The practice of giving a little information about physical properties for the purpose of influencing trade was carried on in Europe as well as here; he did not believe that absolutely pure chloral hydrate had as yet been put into the market, and he was strengthened in this belief by the transactions of the Berlin Apothecaries' Society, where this question was incidentally ventilated. Of late, chloral chloroform, that is, chloroform made by the decomposition of chloral, had been bruited in Germany as the only article worthy of confidence for its purity, but the researches that have been instituted by Schacht and Bilz upon this claimed superiority of chloral chloroform had shown it to be entirely erroneous, as the chloral chloroform when treated with sulphuric acid became discolored very speedily, like the chloral from which it had been prepared, which is not the case with absolutely pure chloral, or with the chloroform purificatum of the Pharmacopœia.

Dr. A. W. Miller exhibited some authentic herbarium specimens of plants gathered by Dr. J. F. Rothrock, Professor of Botany in the University of Pennsylvania, during an extended tour through the Western portion of our country. True

damiana, that from which the original description of *Turnera aphrodisiaca* was taken, and two specimens of *Aplopappus*, yielding also so-called damiana, were shown. Three specimens of *Eriodictyon* were shown, all of them indiscriminately called *Yerba santa*.

Prof. Maisch stated that the specimens heretofore described as *E. Californicum* had the leaves somewhat different from those shown and a characteristic appearance of being varnished upon the upper surface. A specimen of the latter will be submitted to Prof. Rothrock, who had very kindly offered to loan any specimens he had for the purpose of exhibiting at the pharmaceutical meetings.

Prof. Maisch stated that he had been examining different samples sold as *Grindelia robusta*, and concluded that probably three species are sold as such, and that much of it is *G. squarrosa*; he hoped that he would soon be able to report more fully upon the matter.

Prof. Maisch presented specimens of *Florida oranges*, having upon their rind what is called "rust," of a greenish brown appearance, and occasioned, as it seems, by a fungoid growth; it is stated that the same tree, in different years, will produce fruit sometimes thus affected and at others free from this defect.

The subject of obtaining the various products of the orange is one that might well engage the attention of those living in our extreme Southern States; already the juice of the sour orange has been utilized as a source of citric acid, and oil of petit grain, superior to almost any ever offered in our market, has been brought into commerce from this section, and there would seem to be no good reason why the volatile oils of lemon, orange and neroli, and orange-flower water of excellent quality should not be produced there also.

The preparation of bay rum was discussed for a short time, and elicited some remarks throwing light upon the subject. One formula, which produced an excellent article, was as follows: Four pints of alcohol, three pints of water, one pint of Jamaica rum, one drachm of oil of bay and twenty drops of oil of pimento; a few drops of aqua ammoniæ gives the requisite color to a whole gallon; some members employ a little less of the oil of myrcia.

On motion of Mr. Boring, the Registrar was directed to return, through Dr. Miller, a vote of thanks to Prof. Rothrock for his kindness in offering the loan of herbarium specimens to our College.

The use of various fixed oils was suggested for consideration at the next meeting.
 On motion, adjourned.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Boston Druggists' Association held its second annual meeting January 22. The reports from the various officers were read, and show the Association to be in a healthy condition. It has made efforts, and will continue them, with the view of securing the repeal of the proprietary stamp tax during the present session of Congress. The following officers were elected for the ensuing year: President, Dr.

Thos. L. Jenks; Vice Presidents, Nathaniel J. Rust and Jos. Burnett; Executive Committee, A. Sigourney Bird, Thos. Doliber, Thos. Restieaux, Wm. S. Folger, Chas. C. Goodwin, Joel S. Orne and Geo. T. Sears; Secretary, William F. Horton; Treasurer, Samuel A. D. Sheppard.

The annual dinner was subsequently served in Parker's large dining hall, about seventy participating in the festivities, which, to judge from the toasts offered and the spirited manner they were replied to, must have been highly enjoyed by all.

Alumni Association of the Massachusetts College of Pharmacy.—The regular monthly meeting was held at the College rooms, January 3d, President Kelley in the chair.

Mr. Bartlett showed an apparatus for *coating pills with gelatin*, consisting of needles fastened in wood with points upward. The pills, when made, are stuck severally on the points of the needles, and then holding the block of wood in the hand, all the pills are dipped at the same time into the coating solution of gelatin. Mr. Bartlett had found by experiment that this solution could best be made as follows: French gelatin, 6 troyounces; water, 2 pints; dissolve by heat, and to the hot solution add 1 oz. alcohol; cover immediately very tightly to prevent escape of alcohol vapor, and allow to cool with occasional agitation. The alcohol is simply for the purpose of preserving the preparation. The pills should be dipped six times into the solution, which should be very hot and liquid. Allow each coating of gelatin to dry thoroughly before putting on the next. This usually requires several hours.

Prof. Markoe read an extract from Mohr, Redwood & Procter's Pharmacy, page 509, showing that substantially this process was used years ago, and that the alleged claim of certain manufacturers to any proprietorship in the process was unfounded.

Discussion here ensued as to the proportion of gelatin to be used. In the article read by Prof. Markoe, the proportion was 1 part gelatin to 2 parts water. Mr. Lincoln and others thought that for extemporaneous use a single dipping in a solution of gelatin would be the best plan. Mr. Bartlett stated that such had not been his experience. Thick or cool solutions of gelatin were apt to be stringy. Mr. Bartlett closes up the hole made by the needle by applying gelatin solution with a camel's hair pencil.

A long and lively discussion here ensued as to the use by educated pharmacists of coated pills, fluid extracts and such like goods, made by the large manufacturers. The general feeling was that we should discourage the use of all goods that cannot be tested easily by the pharmacist, to determine the quality, etc.

Several gentlemen took the ground that we should not attempt to make any sweeping statements relative to these goods, because it is a well-established fact that all goods can be made as well, and cheaper, on the large scale; that the large manufacturers have already obtained such a hold on the trade of the country that we should turn our attention more to regulate their practices, by buying goods only of those men who have proved themselves honest, paying them a fair price rather than to condemn all these goods by the wholesale. The objection of insolubility was acknowledged by all to be a serious one against the use of coated pills, more especially old sugar-coated pills.

The subject of *reduced iron* came up, the remark being made that there was a marked difference in the appearance of that usually bought by the pound and that imported in small half-ounce bottles. Prof. Markoe referred to an article by J. Creuse, published in the Proceedings of the American Pharmaceutical Association, 1874, and suggested that the grey sample was more likely to be purer than the black.

The selling at retail by wholesale druggists, and the offering of fancy goods by dry-goods dealers at lower prices than those at which they can be procured by most pharmacists, were discussed at some length, and various plans suggested as remedies for the growing evils, but none seemed to meet the general favor.

Messrs. Sheppard and Markoe gave an account of their recent visit to the laboratory of Dr. Squibb, and of a new form of percolator¹ used by him; and after some routine business the Association adjourned.

Alumni Association of the Philadelphia College of Pharmacy.—The fourth social meeting was held Thursday, January 3, President Mattison in the chair.

Mr. Trimble read a paper on the percentage of iron and chloride found by him in the various makes of solution of dialyzed iron (see page 60), and Mr. Herman Betz one on the preparation of *sapo viridis* (see page 65).

Mr. Mattison referred to two cases of poisoning by chlorate of potassium, one in which 300 grains were given in solution daily. On the fourth day toxic symptoms were produced, incessant vomiting was followed by death. In the other, 1 oz. was taken to prove its harmlessness; death occurred on the seventh day.

He also submitted an interesting article on the comparative value of some anti-ferments, those chosen being salicylic and benzoic acids, and sodium bisulphite; the result was largely in favor of benzoic acid (see page 62). Dr. Miller stated that it was taking the place of the former acid with the brewers, who use it to a great extent.

Specimens of fine imported pomades were shown by the same, and processes given for extracts to be made from them. An informal quiz on the Latin noun terminations followed; then adjourned to meet February 7.

WALLACE PROCTER, *Secretary.*

Cincinnati College of Pharmacy.—At the regular meeting, held January 9, the following officers were elected to serve for the ensuing year: President, George Eger; Vice President, F. L. Eaton; Recording Secretary, A. W. Bain; Corresponding Secretary, Louis Schwab; Treasurer, Chas. Faust; Trustees for one year, F. L. Eaton, H. H. Koehnken, Dr. R. M. Byrnes, John Weyer, and for six months to fill unexpired term of the newly elected President, Dr. T. L. A. Greve.

The Paris Society of Pharmacy.—About twelve months since it was mentioned in this journal that the wish of the widow of the late Professor Gobley, to present a sum of money to the Société de Pharmacie, had suggested the proposition of securing the recognition of that Society as an "*établissement d'utilité publique*," so

¹ We hope soon to be able to publish a full description of this, in our opinion, very valuable contrivance.
 —EDITOR.

that it might be enabled legally to receive gifts of money from its members or others. This proposition was unanimously agreed to, and at a meeting held on the 4th of April, 1877, a committee was appointed to report on the subject. This it did in the following month, and then took the requisite steps to communicate with the government officials for the purpose of obtaining the desired object. A decree has now been issued by the President of the Republic granting the privilege sought, and confirming the modified statutes which had been drawn up to suit the altered circumstances of the Society. From among these statutes the following is selected as indicating in a general way the nature of the Society.

The object of the Society is defined to be the establishment of intimate relations among the pharmacists of France and of foreign countries as well as to improve the art of pharmacy and to advance the sciences which relate to it. The number of Members is limited to sixty, resident in Paris, besides which there are twenty Associates and one hundred and twenty Provincial Correspondents; the number of Foreign Correspondents as well as that of Honorary Members is not limited.

One of the necessary steps to obtain the recognition of the Government was the presentation of an historical account of the Society, setting forth its origin, organization, object, and the services it had rendered. From this it appears that the Society took its origin as a consequence of the suppression of the old College of Pharmacy, together with other trade guilds and fraternities, in 1791. The business of the pharmacist being thus thrown open to all without the necessity of special education, accidents became frequent, and gave rise to so many complaints that the Committee of Public Health, then presided over by the celebrated Dr. Guillotin, applied for and obtained a decree reviving the law and regulations relating to pharmaceutical education as well as to the preparation and dispensing of medicines. To quote the report, "The two years of anarchy which preceded this step served at least to teach a lesson that should not be forgotten, for they furnished in a high degree evidence of the necessity of regulating the practice of pharmacy by special laws. It was in vain that the freedom of trade was invoked, since it was out of place, and the interests of the public health ruled the whole discussion of the subject."

Subsequent to this decree the pharmacists of Paris, including, amongst other names eminent in science, Vauquelin, Pelletier, Bouillon le Grange, Le Canu and Parmentier, formed themselves into a voluntary society, having the object of promoting the progress of science, and especially of pharmacy, chemistry, botany and natural history. In 1797 the Directory recognized this Society under the title of the Free School of Pharmacy. Subsequently the title was changed to that of the Society of Pharmacy of Paris, its constitution and statutes being almost the same as those of the present day.

In 1809 an important step was taken in the establishment of an official organ of the Society under the title of the "*Bulletin de Pharmacie*," which in 1815 became the "*Journal de Pharmacie et des Sciences Accessoires*," and this in its turn was succeeded in 1842 by the "*Journal de Pharmacie et de Chimie*."

As regards the connection that exists between the teaching organization and the scientific society it is mentioned that the former rarely exists without being accompanied by the latter. In this manner, in France, the Academy of Medicine is the

necessary corollary of the faculty of medicine, whilst the Society of Pharmacy bears the same relation to the Superior School of Pharmacy, and the provincial societies are in like manner associated with the local schools.

Since 1830 the Society has had the good fortune to have the position of General secretary filled by Robiquet, Soubeiran and Buignet, whose contributions to science have entitled them to hold a high place amongst its cultivators. Other members of the Society have also contributed largely to the advancement of chemistry and its application, amongst whom may be named Serullas, Boullay, Pélouze, Robinet, Serturmer, Pelletier, Caventou and Berthelot, who also belonged to the ranks of pharmacy, and only a few weeks since exchanged his position of Resident Member for that of Associate.

Among other services rendered by the Society of Pharmacy was the part taken at the Medical Congress in 1845, which, upon that occasion, placed the section of pharmacy upon a level with the section of medicine. The excitement caused among French pharmacists in the following year by the promulgation of the *ordonnance* relating to the sale of poisons induced the Society of Pharmacy to appoint a Commission for the purpose of demanding its revision, and it was successful in effecting this object.

In 1863, when a new edition of the Codex was in preparation, six members of the Society were appointed members of the Commission charged with this duty. At the same time the Society divided its sixty resident members into twenty sub-committees for the purpose of revising the mode of preparation and conservation of one or other class of medicaments, thus lending by virtue of their special competence an effectual support to the Commission, to the Academy of Medicine, and to the School of Pharmacy.

More recently, in response to applications from the provinces, a commission of five members was appointed to define the composition and preparation of new remedies, in regard to which there was want of uniformity and consequent inconvenience to medical men, pharmacists and patients. The report of this Commission has recently appeared in this journal.

In addition to these claims to be regarded as a "society of public utility" numerous prizes have been conferred for essays on subjects connected with abstract and applied science, among which may be mentioned those of Bussy on animal charcoal, Fremy on the pectous and gelatinous substances of fruit, and Pasteur of tartaric and racemic acids.—*Phar. Jour.*, Dec. 29, 1877.

EDITORIAL DEPARTMENT.

Preliminary Revision of the Pharmacopœia.—The Committee on Preliminary Revision of the Pharmacopœia appointed by the Philadelphia College of Pharmacy met for organization in September last, and elected Alfred B. Taylor chairman and William C. Bakes Secretary. The committee decided to meet semi-monthly, and a joint meeting is held every two months with the committees appointed by the College of Physicians and the Philadelphia County Medical Society. A series of

questions, prepared by Mr. A. B. Taylor on behalf of the committee of the Philadelphia College of Pharmacy, are being considered by the several committees.

1st. Shall the present Pharmacopœia be so altered as to include only *one* alphabetical arrangement in the whole work? This has been adopted affirmatively.

2d. Shall the description of physical properties of drugs and chemicals be extended? If so, how far? Botanical? Chemical? This was also adopted.

3d. Shall the formulas for the manufacture of chemicals be omitted (with the exception of those preparations where different results are produced by different processes), and descriptions of the substances be substituted, with tests of identity, purity, etc.? This was also adopted.

The committee have agreed to abandon measures of capacity and substitute parts by weight, and to propose that a posological table of active drugs be placed in the back of the book; that the latest chemical symbols and equivalents be given, and that the temperature be stated in degrees of Centigrade and Fahrenheit scales.

The committee favor the introduction of powdered extracts, and that all fluid extracts represent grain for grain.

On the part of the committee of the Philadelphia College of Pharmacy, the work has been divided among the following sub-committees:

Materia Medica—John M. Maisch, C. L. Mitchell, W. B. Webb.

Chemical Formulas—Chas. Bullock, Chas. Spannagel, A. B. Taylor.

Chemical Descriptions and Tests—A. W. Miller, R. Fairthorn, Ed. Gaillard.

Fluid Extracts, Tinctures, Wines, Oleo Resins, etc.—I. J. Grahame, S. S. Bunting, A. Robbins.

Plasters, Extracts, Liniments, Mixtures, etc.—J. P. Remington, H. G. Jones, Wallace Procter.

Syrups, Powders, Pills, Troches, Suppositories, etc.—J. T. Shinn, W. C. Bakes, Thos. S. Wiegand.

At the last joint meeting the following resolution was adopted: That no weights or measures be introduced into the formulary of the United States Pharmacopœia except when required for convenience of dose, and that then the weights be in grains with the corresponding metric weights in brackets.

Most of the points alluded to above have also been discussed and decided by the committee appointed for the same purpose by the American Pharmaceutical Association, and if they should be agreed upon by other medical and pharmaceutical societies undertaking the preliminary revision of the Pharmacopœia, it may be taken for granted that the results of their labors, when presented to the Decennial Pharmacopœia Convention in 1880, will agree in so many respects that the final revision may be accomplished in a much shorter time than heretofore.

Italian Pharmacopœia.—Italy has, as yet, no national pharmacopœia, a compilation by Prof. Orosi having been generally employed. But the want of a recognized standard is felt, and we learn from the "Pharm. Zeitung," that a commission for preparing such a pharmacopœia has been appointed by the government, and organized at Rome, October 2d, 1877, under the presidency of Senator Cannizaro, Professor of Chemistry in the University at Rome

Pharmaceutical Legislation in Pennsylvania.—We learn from the daily papers that on January 22, Hon. Mr. Ringgold, of Philadelphia, introduced a bill to regu-

late the practice of pharmacy and sale of poisons, and to prevent adulteration of drugs, etc., in Pennsylvania. At the time of going to press we have not yet received a copy of the proposed bill, nor have we been able from inquiries made in Philadelphia to learn its provisions or by whom it was drafted. It being a matter which concerns all the pharmacists in the State, it is but proper that they should be heard in relation to the proposed measure. The number of States in which pharmacy laws apply to the entire State is gradually becoming greater, and will doubtless ultimately embrace the whole territory of the United States. The pharmacists should, therefore, be watchful, so that the coming legislation may be wisely guided towards the great aim of such measures, viz., full protection of the public without being oppressive upon the pharmaceutical practitioner. In our opinion, the present would be a fit occasion for calling a convention of Pennsylvania pharmacists at the State Capital, and for the permanent organization of a State pharmaceutical association; and, in furtherance of this object, we renew our suggestion, made in the May number last year, that the pharmacists of Harrisburg take the matter in hand and call such a convention at an early date. From the experience in other States, we judge that there will be no difficulty in Pennsylvania to establish a useful and influential organization.

Correspondents will greatly oblige the Editor by giving their correct address, so that replies may reach them. Several letters were recently returned in consequence of this omission

Correction.—In the list of graduates of the Philadelphia College of Pharmacy, recently published, the name of Mr. George Blinkhorn, a graduate of the class of 1857, was inadvertently omitted.

WILLIAM C. BAKES,
Secretary Board of Trustees.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Year-Book of Pharmacy; comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry contributed to British and Foreign Journals from July 1, 1876, to June 30, 1877; with the Transactions of the British Pharmaceutical Conference at the Fourteenth Annual Meeting, held in Plymouth, Aug., 1877. London: J. & A. Churchill, 1877. 8vo, pp. 653.

Proceedings of the American Pharmaceutical Association at the Twenty-fifth Annual Meeting, held in Toronto, Ont., Sept., 1877 Philadelphia: Sherman & Co., Printers, 1878. 8vo, pp. 647. Price, by mail, bound, \$6.50.

We are enabled to notice the publication of these annuals at the same time, each one having been distributed a little over four months after the close of the respective annual meeting. We have on former occasions discussed the merits and intrinsic value of both publications, and it remains only to state that those before us come fully up to what may be reasonably expected of them. If we should wish for any improvements, it would be, in the *Year-Book*, a more systematized arrangement and briefer abstracts of some of the papers, and in the *Report on the Progress of Pharmacy* of the "Proceedings," more extended notices of some of the researches. It is obvious that such annual reports cannot be intended to entirely supercede the consultation of the original papers, but that they should rather furnish the full out-

line of all more important observations, leaving to those who may be specially interested, to procure the journals or works containing the papers *in extenso*. As to what constitutes such proper "abstracts" must necessarily be decided by individual views, and in a number of cases the British and American reporters differ very considerably in the extent or limitation of these abstracts.

The papers read before both associations are quite creditable, though a difference is here, likewise, noticeable. While our British brethren are treated with quite an array of strictly scientific investigations, the papers presented to the American Association are preponderantly of a practical character, though such of a more heavy calibre are by no means wanting.

Of the two associations, the British, which is the youngest, is the more prosperous, having enrolled almost double the number of members than its older sister. Moreover—and we are pleased to put it on record—the Conference has had on hand at the close of its financial year, June 30, 1877, a cash balance of over £65 besides an investment of £400, of which the annual interest only is used. In addition thereto there is a separate fund, known as the Bell and Hills library fund, which was started in 1869 by Mr. Thos. H. Hills, and now amounts to £200, which sum is invested, the interest being used for presenting to the pharmacists of the cities and towns in which the Conference may meet, ten guineas' worth of books, as an addition to or nucleus for the formation of a library where the assistants or apprentices may assemble for the purposes of study and mutual improvement. The total amount invested by the British Conference is therefore \$3,000.

The financial condition of the American Association has been plainly discussed at the last meeting; the investments amount only to about \$575—the exact figures not being given—and to an additional donation of \$525 conditionally made at Toronto. If these conditions are fulfilled, that is, if at least an equal sum be contributed by the next meeting, with the view of aiding scientific investigations, the investments will be swelled to about \$1,700, or perhaps \$2,000, the interest on nearly all of which will, however, be available only for special purposes, and not for the general expenses of the Association. It has proved to be a wise policy to establish at an early date a reserve fund, which has enabled the Conference to again devote from the general fund £60 for the purchase of material to be used for scientific research.

The financial prosperity of the Conference is in the main due to the large number of promptly paying members. There is room for improvement with us; hundreds, even thousands of eligible persons remain unconnected with the "Association," while they should be members, not only for the purpose of promoting its objects, but, likewise, because they would be directly benefited to a much larger extent than the amount of the annual dues. The "Report on the Progress of Pharmacy" in the one and the "Year-Book" in the other publication, are and should be familiar desk companions of the pharmacist. It is to be hoped that the American Pharmaceutical Association may in a short time not merely have representatives in all the States of North America, but enrol among its members the large majority of the reputable pharmacists, whether in business on their own account, employed by another or retired from business.

The American Pharmaceutical Association has 24 honorary members, all except two being residents of Europe. The British Pharmaceutical Conference has 17 honorary members, of whom eight reside on the North American continent. Mr. Carlos Murray, Buenos Ayres, included in the list, is, we presume, Professor Carlos Murray who died there in July, 1874.

The Philadelphia Druggist and Chemist, devoted to Materia Medica, Pharmacy, Chemistry, Therapeutics, and the Collateral Sciences. C. C. Vanderbeck, M.D., Ph.D., editor and proprietor. 8vo, monthly. Price, \$1.50 per year.

This neatly printed journal, the first number of which is before us, is introduced by the editor as follows:

"In these days there seems to be no end of journal-making, and at the appear-

ance of each new one the question is asked, For what good or purpose? With this issue we present to our readers and friends our 'new-born.' Is there a niche for us to fill? We feel assured there is; otherwise the issuing of the 'Druggist and Chemist' would never have advanced beyond the mere conception. The number of pharmaceutical journals in the United States are comparatively few; in Philadelphia but one. Our field is of such a character, and so different from that of the 'Journal of Pharmacy,' that we can safely say that we occupy an unclaimed position in this city."

The number contains brief original articles on resin of podophyllum, manufacture of pepsin, syrup of ipecac, excipients, and on eye diseases of the poor; also translations, editorials, abstracts, etc., covering altogether 19 pages, and followed by a full price current. The latter, together with such business as concerns the practical druggist, is in charge of Mr Evan T. Ellis.

We wish this new claimant for support a long career of usefulness and prosperity.

A Guide to Chemical Testing; designed for Medical and General Use, and expressly arranged for Practical Study in Schools and Colleges. By J B. Hough, M.D., Professor of Chemistry and Toxicology in the Miami Medical College of Cincinnati, etc. Cincinnati: Printed by the Cincinnati "Lancet" Press, 1877. 8vo, pp. 102

The preface tells us that "this little manual was prepared expressly to meet the wants of those who have but little time to give to practical chemistry"; and that "it is not designed as a reading or reference book, nor as a substitute for any of the excellent large works upon the same subjects, but as a table manual or guide to practical laboratory work." This object has been kept in view throughout the work, but we should wish the author to have stated the common conditions under which the reactions occur or fail, such as acidity or alkalinity of the solutions, and the application of heat. It is not necessary, and in a work of this kind impossible, to "explain every involved and collateral point," and we have no fear "of converting the pupil into a mere memorizing machine" by calling attention to such conditions. In ¶ 36 and 41, for instance, it is merely stated that stannous and stannic compounds are precipitated by $(\text{NH}_4)_2\text{S}$, and in ¶ 43, that for cadmium the reagents for tin may be used and the results compared

The book contains two chapters on *urinalysis* and on the detection of *inorganic* and *organic poisons*, which will prove very convenient and valuable, also a number of useful tables.

A commendable feature is the use of convenient and expressive nomenclature; we entirely agree with the author, when he states in the preface: "Such terms as dihydric sulphide, hydric sulphate, hydric hydrate, etc., not only sound affected and pedantic, but are less convenient than their common names."

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By Robt. Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Philadelphia: Lindsay & Blakiston, 1877. Part xxiv. Price, \$2.

The part of this valuable work now before us contains excellent plates and descriptions of the following plants: *Cæsalpinia bonducella*, *Roxb.* (the bonduc seeds of India, used as an antiperiodic), *Elettaria cardamomum*, *Maton*, *Euphorbia resinifera*, *Berg.*, *Ferula scorodosma*, *Bent and Trim* (the Persian asafoetida plant), *Hydrocotyle asiatica*, *Lin.* (Indian pennywort, an alterative tonic), *Peumus boldus*, *Molina* (the boldo of Chili, used as a tonic and stimulant to digestion), and *Rheum palmatum*, *Lin*

We acknowledge the reception of the following reprints of researches conducted in the laboratory of Prof. Dragendorff, at Dorpat:

Ueber die Bestandtheile des Mutterkornes. (On the Constituents of Ergot.) By Prof. Dragendorff.

Zur Formel der Frangulinsäure. (The Formula of Frangulic Acid.) By E. Keussler.

Bestimmung der Alkaloide in den Chinarinden. (Estimation of the Alkaloids in Cinchona Barks.) By Edwin Johanson.

Ueber die Alkaloide des Delphinium staphisagria. (On the Alkaloids of Stavesacre Seeds.) By Provisor Marquis.

Ueber Calcaria Phosphorica. (On Calcium Phosphate; see "Amer. Jour. Phar.," 1877, p. 512.) By E. Hirschsohn.

Etude sur les térébenthines et spécialement sur la térébenthine de Bordeaux. (On the Turpentine, and especially on the Turpentine of Bordeaux.) By Albert Fonsac.

This is a creditable thesis, presented to the Superior School of Pharmacy at Montpellier.

The reception of the following pamphlets is hereby respectfully acknowledged: *Contributions to the History of Medical Education and Medical Institutions in the United States of America, 1776—1876.* Special Report, prepared for the United States Bureau of Education by N. S. Davis, A.M., M.D.

Higher Medical Education, the True Interest of the Public and of the Profession. Introductory Address by Wm. Pepper, M.D., Professor of Clinical Medicine in the University of Pennsylvania.

Higher Medical Education—The New Departure in Medical Teaching in the University of Michigan. Introductory Lecture by A. B. Palmer, A.M., M.D., Prof. of Pathology and the Practice of Medicine.

Medical Chemistry and Toxicology. An Address delivered before the International Medical Congress at Philadelphia, September, 1876, by Prof. Th. G. Wormley, M.D., etc.

Note sur la formation de l'acide oxalique pendant la destruction des matières animales, par le procédé de Fresenius et Babo. (On the Formation of Oxalic Acid during the Destruction of Animal Matters by the Process of Fresenius and Babo.) By M. Edm. Van Melckebeke, D.Sc., Pharmacien, etc., Antwerp.

Etude sur les liquides pathologiques de la cavité péritonéale. (On the Pathological Liquids of the Peritoneal Cavity.) By Dr. C. Méhu, Pharmacien, Paris.

On Keratitis bullosa. By Dr. M. Landesberg, of Philadelphia.

What Anæsthetic shall we Use? By Prof. Julian J. Chisholm, M.D., Baltimore. (Argument in favor of chloroform.)

Cholera Infantum—Treatment of the Cold Stage. By E. F. Wells, M.D., Minster, O. Aiken as a Health Station. By W. H. Geddings, M.D., Aiken, S. C.

The Annual Medical Directory of Regular Physicians in the State of Illinois for the Year 1878. By F. A. Emmons, M.D., Chicago, Ill.

OBITUARY.

JAMES A. TAYLOR, a prominent and highly respected druggist and apothecary of Atlanta, Ga., died at Hot Springs, Ark., Jan. 14, at the age of 49 years, 1 month, and was buried at Atlanta, Jan. 17. At the latter place the deceased had been in business for over 25 years.

THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1878.

LIQUOR FERRI, PEROXYCHLORIDE OF IRON, DIA- LYZED IRON, CATALYTIC IRON.

BY EMIL SCHEFFER.

(Read at the February Pharmaceutical Meeting of the Louisville College of Pharmacy.)

The different views regarding the composition of dialyzed iron, of whose preparation a great deal has been written in our periodicals for the last twelve months, induced the writer to make a series of experiments which will no doubt throw some light on the subject and also show the relation of peroxychloride of iron, dialyzed iron and catalytic iron.

By precipitating a solution of ferric chloride with ammonia, the precipitate differs according to the quantity of ammonia used as precipitant. Ammonia added as long as a precipitate is formed yields an oxychloride, and the liquid above the precipitate has *acid* reaction. Ammonia added carefully until the supernatant liquid has become perfectly *neutral* produces a more basic oxychloride. Ammonia added to *excess* yields a precipitate free of chlorine but containing ammonia. Of these three precipitates the two first ones are soluble in water, the third one is insoluble.

In the following experiments 300 cc. of the officinal ferric chloride solution were diluted with water to 1,500 cc., and 150 cc. of this dilute solution were taken for each experiment. The ammonia was also diluted with water; but spec. grav. was not taken, as it was not deemed necessary.

a. To 150 cc. of the dilute ferric chloride solution dilute ammonia was added, in small quantities at a time, to saturation, that is, to the point at which a further addition of ammonia produced a permanent precipitate. To effect this, 81.3 cc. of ammonia were required; the smallest quantity of ammonia added now produces a copious precipitate, and on an addition of 1.7 cc. more, or about two per cent. of

the quantity needed for saturation, all iron was precipitated, while the clear, colorless liquid above the precipitate showed acid reaction.

The same experiment was repeated, but to the mixture obtained after the addition of respectively 81.3 and 1.7 cc. of ammonia, ammonia was added to perfect neutralization of the supernatant liquid, 6 cc. being required, making the total of ammonia 89 cc. Although the liquid is perfectly neutral, the precipitate is not pure ferric oxide, but contains still a considerable quantity of chlorine.¹

The precipitate of *a*, washed several times by decantation, until on addition of fresh water it settles slowly and remains suspended for a long time, is then collected on a filter and after thorough draining washed carefully with small quantities of water at a time. The liquid passes through very slow and assumes, after a time, a yellowish color, which becomes deeper yellow by continued washing; the precipitate on the filter changes thereby its appearance, shrinks considerably, and obtains at last a darker brown, almost black, color, and has the consistence of a jelly. When all the precipitate is converted into a black jelly, which in thin layers is transparent and of a deep garnet-red color, the wash water no longer passes through the filter unless a very large quantity is above the precipitate, when it may happen that it dissolves at once, forming a black-red liquid. If the jelly is taken from the filter, a small quantity of water added to it is sufficient to dissolve it entirely after some time. The solution has, in reflected light, a pure black color, dissolves in more water to a transparent deep red solution, is neutral, but still contains ammonium chloride, as the jelly forms before it is all washed out.

A second precipitate, obtained in the same way, was, after draining off the supernatant acid liquid, subjected to dialysis. In the same degree as the acid and ammonium chloride is removed, the precipitate in the dialyzer changes at first into a jelly-like black mass and afterwards into a turbid thick liquid of the consistence of cream. Taken then (after three weeks) from the dialyzer, it dissolves on the addition of a little water, after a few days, to a perfectly clear, thin liquid, of a brownish-black color.

By using more ammonia than is necessary to precipitate the iron,

¹ By calculation it was found that 92.6 cc. of the ammonia were necessary to bind all the hydrochloric acid in 150 cc. of this dilute ferric chloride solution.

precipitates are obtained, which are also soluble in water, provided that ammonia was not added in excess. The more ammonia is used the more basic the precipitates will be; these have the advantage that the ammonium chloride can be more perfectly removed by washing before the precipitates begin to dissolve, which is evidenced by the yellow color of the filtrate, so that they may be washed until the filtrate becomes merely opalescent on addition of silver nitrate, or keeps perfectly clear. It is of the greatest importance that these more basic precipitates be as free as possible from ammonium chloride, since a small quantity prevents their solution. (It is the presence of ammonium chloride, also, that causes the gelatinization of solutions of the less basic oxychlorides.)

These more basic precipitates do not form a jelly after being thoroughly washed, but finally form a thick blackish syrupy liquid, which when taken from the filter gives, on addition of a little water, a very turbid mixture, and, on standing several days, a thin clear liquid, of a brownish-black color, or they only change their color by washing to a somewhat darker but not black hue, without losing much of their bulkiness. This is the case with the precipitates that were removed from a neutral supernatant liquid. After they are washed until the filtrate remains clear on addition of silver nitrate, the precipitates are taken from the filter and transferred with a little water into bottles, so that they can be shaken from time to time. The color of the mixture is then reddish-yellow or reddish-brown, but darkens from day to day as the precipitate enters solution. In the course of several weeks a clear thin liquid, of brown color, is obtained. A temperature of 80° to 85°F. accelerates the solution of the precipitates, while a much higher temperature prevents it.

A few experiments were made by adding to the precipitates, in perfectly neutral liquids, respectively one-half and one per cent. of the ferric solution. Under frequent stirring the mixture was allowed to stand for two days, after which the washing was commenced, and concluded finally on a filter, as above mentioned.

The writer gives below the results of the analyses of different preparations obtained by the above-explained methods, the analyses being made as follows:

The solutions were thoroughly mixed with an excess of pure sodium carbonate and evaporated to dryness. After dissolving the excess of

sodium carbonate and the sodium chloride in water, the filtrate was acidulated with nitric acid, and the amount of chlorine determined with a tenth normal solution of nitrate of silver; the ferric oxide was calcined and weighed.

a. Solution of precipitate obtained with 81.3+1.7 cc. ammonia— $\cdot490 \text{ Fe}_2\text{Cl}_3 + \cdot061 \text{ Cl} = \cdot441 \text{ Fe}_2\text{O}_3 + \cdot0953 \text{ Fe}_2\text{Cl}_3 = 82.6 \text{ per cent. Fe}_2\text{O}_3 + 17.4 \text{ per cent. Fe}_2\text{Cl}_3$.

b. Solution of precipitate obtained with 81.3+three times 1.7 cc. ammonia— $\cdot365 \text{ Fe}_2\text{O}_3 + \cdot0248 \text{ Cl} = \cdot346 \text{ Fe}_2\text{O}_3 + \cdot0385 \text{ Fe}_2\text{Cl}_3 = 90 \text{ per cent. Fe}_2\text{O}_3 + 10 \text{ per cent. Fe}_2\text{Cl}_3$.

c. Solution of precipitate obtained with 81.3+four times 1.7 cc. ammonia— $\cdot614 \text{ Fe}_2\text{O}_3 + \cdot0382 \text{ Cl} = \cdot5853 \text{ Fe}_2\text{O}_3 + \cdot0583 \text{ Fe}_2\text{Cl}_3 = 91 \text{ per cent. Fe}_2\text{O}_3 + 9 \text{ per cent. Fe}_2\text{Cl}_3$.

d. Solution of precipitate obtained with 81.3+4.5 times 1.7 cc. ammonia— $\cdot411 \text{ Fe}_2\text{O}_3 + \cdot0223 \text{ Cl} = \cdot3942 \text{ Fe}_2\text{O}_3 + \cdot034 \text{ Fe}_2\text{Cl}_3 = 92 \text{ per cent. Fe}_2\text{O}_3 + 8 \text{ per cent. Fe}_2\text{Cl}_3$.

e. Solution of precipitate obtained by adding 1 per cent. of ferric chloride solution to the precipitate caused by 89 cc ammonia— $\cdot455 \text{ Fe}_2\text{O}_3 + \cdot0308 \text{ Cl} = \cdot4318 \text{ Fe}_2\text{O}_3 + \cdot047 \text{ Fe}_2\text{Cl}_3 = 90.2 \text{ per cent. Fe}_2\text{O}_3 + 9.8 \text{ per cent. Fe}_2\text{Cl}_3$.

f. A precipitate formed by adding to 150 cc. of the ferric chloride solution 91.5 cc. of ammonia, and washed until the filtrate remained perfectly clear on addition of silver nitrate, gave on analysis— $\cdot416 \text{ Fe}_2\text{O}_3 + \cdot00602 \text{ Cl} = \cdot4115 \text{ Fe}_2\text{O}_3 + \cdot00917 \text{ Fe}_2\text{Cl}_3 = 97.83 \text{ per cent. Fe}_2\text{O}_3 + 2.17 \text{ per cent. Fe}_2\text{Cl}_3$.

This precipitate was transferred to a bottle, with a little water, and is shaken occasionally. At the date of this paper it has stood a little over seven weeks, during which time over three-fourths of the original precipitate has dissolved. The writer is fully convinced, to judge from its appearance, that it will ultimately dissolve entirely.

g. Another precipitate, obtained with a little more ammonia than *f* gave— $\cdot424 \text{ Fe}_2\text{O}_3$ and $\cdot00318 \text{ Cl}$.

This precipitate has, at the date of this paper, not shown the least sign of ever dissolving, although it has stood as long and been shaken as often as *f*.

For comparison, the writer has examined several *commercial* preparations of *dialyzed iron*:

I. $\cdot604 \text{ Fe}_2\text{O}_3 + \cdot0371 \text{ Cl} = \cdot576 \text{ Fe}_2\text{O}_3 + \cdot057 \text{ Fe}_2\text{Cl}_3 = 91 \text{ per cent. Fe}_2\text{O}_3 + 9 \text{ per cent. Fe}_2\text{Cl}_3$.

II. $\cdot255 \text{ Fe}_2\text{O}_3 + \cdot01275 \text{ Cl} = \cdot2454 \text{ Fe}_2\text{O}_3 + \cdot01947 \text{ Fe}_2\text{Cl}_3 = 92.6 \text{ per cent. Fe}_2\text{O}_3 + 7.4 \text{ per cent. Fe}_2\text{Cl}_3$.

III. $\cdot534 \text{ Fe}_2\text{O}_3 + \cdot0203 \text{ Cl} = \cdot5187 \text{ Fe}_2\text{O}_3 + \cdot031 \text{ Fe}_2\text{Cl}_3 = 94.47 \text{ per cent. Fe}_2\text{O}_3 + 5.53 \text{ per cent. Fe}_2\text{Cl}_3$.

IV. $\cdot 274 \text{ Fe}_2\text{O}_3 + \cdot 0125 \text{ Cl} = \cdot 2646 \text{ Fe}_2\text{O}_3 + \cdot 0191 \text{ Fe}_2\text{Cl}^3 = 93\cdot 3 \text{ per cent. Fe}_2\text{O}_3 + 6\cdot 7 \text{ per cent. Fe}_2\text{Cl}_3$.

Dr. Hager's *Liquor ferri peroxychlorati*, which he prepares by dissolving the ferric hydrate obtained from 115 parts of ferric chloride solution in 10 parts of the same ferric chloride solution, contains, when all the ferric hydrate is dissolved, 85 per cent. Fe_2O_3 and 15 per cent. Fe_2Cl_3 . No doubt a more basic preparation could be realized by Dr. Hager's method, that is, by dissolving ferric hydrate in ferric chloride solution, if the ferric hydrate were perfectly pure. But, as his ferric hydrate always contains ammonia, which cannot be removed by washing, this ammonia forms, when the precipitate is added to the ferric chloride solution, ammonium chloride, which sets a limit to the solution of ferric oxide. The basicity of this preparation stands in inverse ratio to the quantity of ammonium chloride in it.

Dr. Wagner, the originator of dialyzed iron, does not communicate the method for making his later preparation, the *catalytic iron*, but asserts that it is not made by dialysis, and that it takes three months to make it. To judge by this, the supposition might not be far from wrong, that it is a solution of a basic oxychloride precipitate, obtained as above explained. The writer could not obtain any of Dr. Wagner's catalytic iron, and therefore cannot say how much chlorine it contains in proportion to the ferric oxide; that it does contain chlorine Dr. Hager has fully proven.

The above experiments teach us that the preparation of a perfectly pure ferric hydrate is very difficult, almost impossible, as in one case it is apt to contain chlorine, in the other ammonia. They prove that the precipitate of oxychloride of iron is soluble in pure water, and that in its more basic combinations it is only soluble when free of saline compounds.

They likewise prove that a solution of very basic oxychloride can be prepared without dialysis, and that the product may be made to contain a less per cent. of chlorine than that found in the best commercial sample of dialyzed iron examined by the writer.

By referring to the precipitate of experiment *g*, it becomes evident that the solvent power of ferric chloride on ferric hydrate has a limit. This indicates at the same time that a pure ferric hydrate will not dissolve, and that in all the different iron solutions, whether they be called peroxychloride, dialytic or catalytic, the ferric oxide is kept in solution

by ferric chloride. As the proportion of these two ferric compounds can be changed at will, a chemical combination of them cannot be well thought of.

Louisville, February, 1878.

DIALYSIS.

BY RICHARD V. MATTISON, PH.G.

(Read at the Alumni Meeting, February 7.)

It would be a matter of curious interest to know how many times in the past few months the question, What is *dialyzed* iron? what do you mean by *dialyzed*? has been asked and answered; answered in many instances, we fear, in a very unsatisfactory manner, since the explanation of the true meaning of dialysis escapes many because of its very simplicity. It means simply *separation*; a separation which differs from filtration, however, in this respect: that, while the latter is a separation of soluble from insoluble substances, the former is a separation of substances soluble in the same media in common, but differing from each other in their different diffusibility. By diffusibility we mean the power possessed by certain bodies of passing through animal or vegetable membranes. With gases this diffusive power has long been well known, and Graham long ago laid down the rule that "the diffusive power of all gases, simple and compound, varies inversely with the square root of the density of the gas itself."

The diffusive power of solids follows no definite rule. Solids of the same chemical constitution diffuse with the most unequal velocity; for instance, if we make a dense solution of a mixture of sodium and potassium chlorides, and pour carefully on the solution a stratum of distilled water, in a few hours the latter will contain a large proportion of the potassium chloride, but scarcely a trace of the sodium salt. The ammonium chloride diffuses still more rapidly, hence it is readily seen that the rate of diffusion, or, if you will, dialysis, varies without apparent cause. To a certain limit, which is found in practice to average about 5 per cent., differing, however, with different salts, the rate of diffusion increases with the density of the solution, and hence the fact that chemical solutions, *e. g.*, the mixture of ferric chlorides and oxychlorides, dialyze rapidly at first, but afterward more slowly.

We are all familiar with the diffusion occurring in the porous cell of

a galvanic battery ; but is it necessary, in order that diffusion shall occur, that the septum or membrane shall be porous? Not in the ordinary acceptation of the term, at least, as diffusion or dialysis takes place most rapidly through structureless basement animal membrane, where, with the most carefully-corrected objective, we are unable with the highest powers of a microscope to differentiate a single stoma ; or, as perhaps a more simple instance, we may take Lhermite's experiment in illustration, viz. : A tube was partly filled with chloroform, upon this was poured a column of water, and above this was placed a column of ether. After standing a short time, the ether had passed entirely through the stratum of water and become mixed with the chloroform. Or again, we can illustrate this diffusion through a non-porous septum by taking a stratum of sulphuric acid in a tube, above it one of water and above this a solution of blue litmus in alcohol. In a short time the litmus will be reddened through the diffusion of the acid into the alcohol. Now, in these experiments it is obvious that water is not in any sense a porous medium, and hence we dismiss any theory having the porosity of membranes as its foundation.

Let us now note the various circumstances that modify or increase this peculiar property, and primarily stands the fact that a liquid to diffuse or dialyze must be capable of "wetting" the interposed membrane ; for, of course, if the liquid is of such nature that it cannot be imbibed by the membrane no dialysis can occur, or if only one liquid is capable of wetting the membrane, then dialysis will only occur in one direction, viz., from this liquid.

Liquids to be proper subjects for dialysis should be perfectly miscible with each other, or if salts, they should be dissolved in a common medium, and of all media water is the best. The solutions should be of different densities, though this is not indispensable, as solutions of different substances of the same density will dialyze perfectly, though with less rapidity.

Again, liquids pass more rapidly through some animal membranes from within outward, than *vice versa*, as, for example, from the interior of a bladder or a stomach outward, the current being always strongest on the side presenting the epithelial surface, but a discussion of this, though exceedingly interesting, is rather a digression from the proper subject of this paper.

The rate of diffusion is accelerated by a moderate increase of temperature, hence dialysis is best performed at a moderate temperature.

To a proper understanding of dialysis, it is important that all idea of chemical action shall be disassociated from it. We have before us a circular on Dialyzed Iron, stating that the mixed solution of ferric chloride and oxychloride, when brought into the dialysator, is decomposed, hydrochloric acid passing through the membrane, leaving behind a solution of ferric hydrate. Of course, this is incorrect, but it is the circulation of just such statements which makes it necessary to disassociate all idea of chemical action from dialysis, as in the instance above quoted the ferric chloride is dialyzed, or in other words, simply separated from the non-dialyzable ferric oxychloride, leaving the latter remaining in the dialysator.

All soluble substances may be divided into two classes, viz., those of high diffusive power, embracing nearly all those crystallizable, which are hence called crystalloids, and those of low diffusive power or non-diffusible, of which albumen is a good example, these being called colloids; these latter are generally amorphous in character.

This may be exemplified by breaking the shell of an egg at one extremity without rupturing the membrane, and inverting it in a wine-glass of distilled water. After a few hours the saline constituents of the egg will have passed through the membrane, while the albumen will be found to have passed through the membrane very slightly, if at all. There is obviously here no chemical reaction; it is evidently simply a separation, or in other words, a true dialysis. When this albumen is acted on by pepsin it is converted into albuminose, which possesses, curiously enough, the property of dialyzing or passing through the membrane with extreme facility.

Boiled starch does not dialyze, while glucose dialyzes very rapidly, hence starchy and albuminoid food cannot dialyze, or in other words, cannot be absorbed until after being digested.

The recently-formed protoplasm passes through the millions of cell walls of the ducts of plants by the law governing dialysis, the differentiated protoplasm remaining to increase the cell walls, and the salts and undifferentiated protoplasm passing through the walls of the cells, which, after all, are only like so many basement structureless membranes.

Salicylic acid is purified by passing through the membrane, the gummy resinous matter, which so tenaciously adheres throughout repeated crystallizations, is mostly removed by dialysis, the pure acid passing through the membrane being separated or dialyzed from the colloid or uncrystallizable contamination.

When the contents of a stomach in cases of medico-legal examinations are placed in a bag of membrane, and this floated in distilled water, the crystalloids (neutral salts, strychnia, corrosive sublimate, etc.) pass through the membrane, while the mucus, albumen, etc., remain behind. Obviously again, there is no chemical reaction here. It is simply a separation, or in other words, a dialysis.

The greater the density of liquids or gases on opposite sides of the membranes the more rapid will be the dialysis. We have all bought the fancifully-colored hydrogen balloons sold on the street corners, and found them, to our dismay, grow smaller day by day, until at last we had only a small rubber bag to console ourselves for the loss of the pretty toy. Here we have by the law of diffusion just as much a true dialysis as we have in the fact that air, upon being drawn into the lung of an animal, diffuses to the most peripheral air vesicle, and the carbon dioxide, by the same law, passes to the external air.

As a summary of the preceding remarks, let us say that dialysis is to be carefully distinguished from filtration, as it is properly the separation by a natural law of substances soluble in a common medium, but possessed of different diffusive power.

RAPID FILTRATION.

BY RICHARD V. MATTISON, PH.G.

(*Read at the Alumni Meeting, February 7, 1878.*)

It is often a matter of considerable annoyance to the pharmacist desirous of dispensing elegant preparations, that no means of filtering cloudy or murky-looking prescriptions are at hand by which this desideratum may be attained in a few moments. It is often desirable to dispense syrups, etc., that are "star bright," and yet be able to do it while the customer is waiting. While a large number of processes and apparatus are suited to the wants of the manufacturer, few if any yet published supply the real want of the dispenser, viz., something for instant use at the prescription counter. To supply this want I have the pleasure of bringing forward to-day the following simple apparatus.

It is presumed every druggist is the possessor of a retort stand; the rings of this are bound with cloth or muslin until the central aperture is of just sufficient size to admit a globe of hard German glass, such as is used for the ordinary student's lamp. The reason we prefer a lamp

globe to an ordinary tube is that it has an enlargement at the base which serves as a shoulder, and thus renders the apparatus more firm.



The tube being now placed in the holder in the same manner as a test tube would be ordinarily placed, the open lower extremity is covered with a piece of filter paper in the following manner, viz.: A circular or square piece of muslin is covered by a similar piece of filter paper, and the two bound firmly over the open lower extremity of the tube with the paper inwards, and secured by means of a rubber band (such a circular rubber ring as is used for umbrellas seems best adapted for this purpose). Should we now fill the tube with liquid it will filter slowly, and we hasten it by fitting a good velvet cork in the upper extremity of the

glass tube or lamp globe, piercing it with a metal tube, and attaching to this an ordinary rubber pipe connected with a bulb, such as are used in the small atomizers or syringes. By compressing the bulb air is forced into the tube, and the increased pressure rapidly increases the flow of filtrate. By this means an ordinary 4 oz. or 8 oz. mixture can be filtered in a very few minutes, and dispensed with satisfaction to the pharmacist and of pleasing appearance to the patient.

This is not offered as entirely new, as the credit of the idea belongs to Messrs. Sykes and Newton, of Hartford, Conn., who have long used a similar apparatus with such evident success as to make their neighbors copy the same.

The apparatus exhibited was manufactured from a lamp globe and an atomizer, the total cost of the same being, without including the retort stand, the sum of 65 cents. Actual use at the laboratory has proved its utility in a small way, and for such purposes it is recommended.

NOTE ON THE TINCTURES OF THE U. S. P.

BY THEODORE G. DAVIS, PH.G.

From observation and experiment, I think it would be preferable in the coming Pharmacopœia to have official *Alcohol dilutum* containing 50 per cent. of alcohol, *Alcohol* containing 70 per cent. of anhydrous alcohol and *Alcohol fortior* as at present.

An alcohol of 50 per cent. is preferable in most instances to a weaker spirit, and could be substituted to advantage for the present diluted alcohol, as in most of the tinctures prepared with it there is a cloudiness which becomes clear on the addition of some alcohol; this is particularly noticeable in the tinctures of roots and leaves containing resin and volatile oil. Valerian is a good example, and I can corroborate in every particular the facts set forth by Mr. George W. Kennedy in the February "Journal," in the article on Tincture of Cantharides.

Capsicum, if the percolation is properly conducted, always precipitates a flocculent matter, while floating on the surface is a fatty substance. This may be remedied by a stronger menstruum.

It is my opinion that the tinctures should be more concentrated, and should represent at least one part of the drug in four of the finished product. The menstruum necessary to attain this result is in most instances sufficient to exhaust the drug if the percolation is properly conducted, and I have noticed frequently that the first half of the tinctures are void of sediment, which separates as the weaker solution percolates into it. This is notable in tinctures of the leaves, hence it would seem that more concentrated preparations would be more satisfactory as pharmaceutical preparations, and yet I do not think there is a satisfactory fluid extract in the Pharmacopœia, nor that there is one which *represents* one grain of the drug in a minim; I do not believe it can be made. Some are very nice when first made, but precipitate the active part (resin or tannin), and become comparatively worthless upon standing, as they must, on our shelves.

Bridgeton, N. J.

EMPLASTRUM PICIS LIQUIDÆ.

BY F. MARION MURRAY, M.D.

Having a call a few days since for a tar plaster, I searched several books of reference for some guide to its preparation, but without avail. Being thrown upon my own resources, I hurriedly melted together 2

parts each of tar and yellow wax, and 1 of Burgundy pitch, and dispensed an unsatisfactory plaster.

Subsequent trials with resin, Burgundy pitch, yellow wax and official lead plaster as "bodies," in various proportions, gave the following results :

Lead plaster an unsightly result, and objectionable because of the different medicinal effect of the "body." Yellow wax, in any considerable proportion, gave unsightly plasters, with diminished adhesiveness. Pitch, in the proportion of 2 parts to 1 of tar, gave a nice looking plaster, but it was rather too adhesive and did not contain enough tar ; it was better replaced by tar's nearest relative, resin. An excellent plaster, and one containing the greatest amount of tar, was made of equal parts of tar and resin. The most satisfactory result was obtained from 2 parts each of tar and resin and 1 of pitch. Melt the resin and pitch together, remove from the fire, add the tar and stir rapidly. Spread on chamois or cloth when it cools to the consistence of honey. Two-fifths of this is the remedial agent ; it is adhesive and elegant.

Philadelphia, Feb. 11th, 1878.

Note by the Editor.—The former Pharmacopœia of Hannover directed this plaster to be prepared from Burgundy pitch 1 part, yellow wax 8 parts, and tar 16 parts. Dorvault's *l'Officine* credits the following formula to Van Mons : Burgundy pitch 8, yellow wax 90, and tar 125 parts.

SOLUBLE MEDICATED BOUGIES.

BY C. L. MITCHELL.

Read at the Pharmaceutical Meeting, February 19, 1878.

During the last year considerable attention has been directed to the treatment of urethral diseases by means of soluble medicated bougies. These are, in fact, long, thin suppositories, made of soluble materials and variously medicated, and offer to the physician a ready and convenient method of local medication.

The idea of these bougies is not by any means a new one. Its history is a little obscure, but, so far as I can ascertain, they were first used by Sir Jas. Simpson, of Edinburgh, about twenty years ago, in his practice, and met with success. They were soon afterwards introduced into this country by several of our prominent pharmacists, and

became a method of treatment for gonorrhœa, etc., among some few physicians. The idea of suppositories being then prevalent, they were called urethral suppositories, and moulds were introduced by several manufacturers for their preparation.

They generally were made of cacao butter, and were about 2 to 3 inches in length and $\frac{3}{16}$ inch in diameter, generally tapering to a blunt point. These were used in practice only to a very limited extent, and the matter appears to have slumbered until a few years ago, M. Reynal, a pharmacien of Paris, introduced the "Porte-Remède," as he termed them. They immediately attracted considerable attention from the French physicians, and a number of remarkable cures were made by them in the hospitals of Paris. They were soon after introduced into the United States by Mr. Louis Bock, of New York, and met with considerable sale, their high price, however, being a great obstacle to their general adoption.

Recently, Messrs. J. C. Allan & Co., of Buffalo, have taken a patent for the manufacture of a similar article.

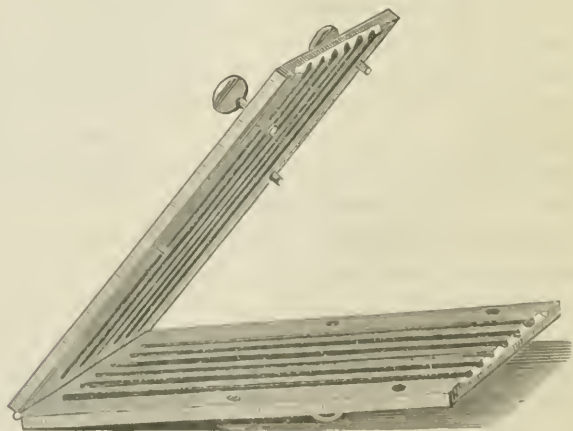
The idea of the treatment of gonorrhœa and gleet by means of these bougies seems to be a good one. It is well known that very few who have occasion to use urethral injections do so with much advantage, and often do more harm than good by their unskillful use of the syringe; so that if a remedy can be obtained which will do away with this objection, a great step will be made in the treatment of these diseases. It is also a well-known fact to all medical men that many cures have been produced by the introducing of a plain metal bougie, or one slightly smeared with some medicated ointment. It would seem to be much better, then, to have a bougie elastic, so as to be easily entered, and made of some suitable material which can be variously medicated, and and at the same time to be slowly soluble by the heat and secretions of the urethra, so as to bring remedial agents in close contact with the diseased parts. It would thus exercise the double action of relieving by causing a distension of the urethra, thus compressing the capillaries and reducing congestion, as well as the curative power which the medicines dissolved in it would exercise. It would also be of service by separating the inflamed surfaces, preventing their adhering and forming strictures, etc.

The "Porte-Remède" of M. Reynal are bougies about $5\frac{1}{2}$ inches long and $\frac{1}{8}$ inch in diameter, very stiff and hard, and indeed quite brit-

tle, although when immersed in water for a time they become flexible. They seem to be composed of molasses and gum arabic or gelatin, and are variously medicated.

The bougies of Messrs. Allan & Co. are claimed by their patent to be made of cacao butter and glycerate of starch, worked into a plastic mass by means of mucilage of gum arabic or tragacanth, this rolled or divided into bougies and coated with gelatin or isinglass by dipping them in a hot solution of the same. They are medicated variously, but generally are put up in the form of a proprietary medicine. They are quite soft and soluble, but are not very flexible, very quickly breaking and mashing up when manipulated for a few moments, and thus offer a considerable objection to their use, as the handling necessary for their introduction is sufficient to destroy them, particularly in warm weather.

About a year ago, I commenced the manufacture of these bougies by a method of my own, using for their composition a mixture of glycerin and gelatin, similar to that mentioned by Prof. Parrish in the "*Am. Jour. Phar.*" for April, 1872, p. 188. The mass made in this manner is suitably medicated, and then while quite hot and liquid poured into moulds, which are represented in the subjoined drawing.



These are made of two plates of brass, hinged together at one end, and with corresponding grooves cut in them so as to make a long, thin cylinder of about the caliber of a No. 8 bougie. When the composition has cooled the bougies are removed from the mould and laid on wooden

trays, which are kept in a dry atmosphere, ranging from 70° to 80°F., for about two days, when they are scraped to remove any rough edges left by the joints of the moulds, and the rough ends trimmed off. In this manner I have made quite a number of bougies, which have been used by our physicians with considerable success. They will dissolve in water of 100° to 103°F. in from 10 to 15 minutes, and in the urethra in from 1 to 3 hours. They are quite flexible and elastic, being readily tied into a knot and untied again, and do not either break as Reynal's or mash up as Allan's, when handled only becoming more flexible and elastic, resembling the bougies and catheters of elastic hard rubber which have lately come into use. They can be easily introduced into the urethra by either dipping in water or slightly oiling them.

OIL OF WILD CHERRY KERNELS.

BY HERMAN BETZ.

(*Read at Alumni Meeting, February 7, 1878.*)

This oil is obtained from the kernels of the fruit of *Cerasus serotina*, by hot expression. For several years the kernel of the wild cherry, enclosed in the shell or endocarp, has appeared in quantities in the market, at such a price as to induce manufacturers to express the oil, which may find a use in medicine or the arts. The kernels, together with the shell, are ground to a fine powder, which is carefully dried, and expressed in the cylinder of a hydraulic press at about 2,000 pounds to the square inch. The yield is about 5 per cent.

Although great care is used to avoid all dampness of the powder, the oil has a slight odor of bitter almonds, which, however, is not injurious; the taste is sweetish, agreeable; the color is dark green and is not extracted by water or alcohol, hot or cold. Sp. gr. 0.906. It becomes solid at 15°F.; the point of ebullition is above the boiling point of mercury; it then takes fire and burns with a yellow flame, leaving a pitch-like residue. Vapors are given off at 280°F., but are not disagreeable until the temperature reaches 600°F.; it would for that reason be well adapted for an oil-bath. The oil is insoluble in alcohol, but freely soluble in ether, chloroform, oil of turpentine, olive oil and benzine.

As characteristic may be taken its slight bitter almond odor and high boiling point. It can be distinguished from oil of laurel, which has a

somewhat similar color, by alcohol, which takes up the coloring matter of the latter, and from linseed oil by becoming solid at a much higher temperature.

POISONING BY CHLORATE OF POTASSIUM.

BY GEORGE W. KENNEDY, PH.G.

Read at the Alumni Meeting, February 7, 1878.

A case of poisoning by the above-named chemical occurred in November last, in the family of Dr. Kauffman, of Pine Grove, now of Minersville, Schuylkill county. The case will be interesting, as there is but one on record previous to this where death has resulted by an excessive use of the drug, so far as I am informed—that of Dr. Fountain, of Davenport, Iowa, who took one ounce at a dose, and fell a victim to his temerity. The writer waited on the father of the deceased child, so as to obtain reliable information. I believe that the salt has been considered, both by the medical and pharmaceutical profession generally, as rather an innoxious remedy, comparatively speaking. No doubt to many this case will appear remarkable, and they would rather feel disposed to attach discredit to it, as the writer would feel inclined to regard the fatal result due to some other poison, were he not in possession of such information direct from the father of the deceased child, who is a practicing physician, and stands well in the estimation of the medical fraternity of the county where he resides. Many would hesitate to class chlorate of potassium as a poison, when we take into consideration that it is used in diphtheria and scarlatina in large doses with impunity, and is known in nearly every family, like Epsom salts or magnesia, or any other common drug; in fact, there are few who have suffered with the simplest or more aggravated form of sore throat but are familiar with it as a remedy which for convenience is often kept on hand.

For the reason stated, Dr. Kauffman kept a quantity of the chlorate in a tin box, and at the time of the accident the box contained approximately about four ounces. It was customary with the doctor to give his children, consisting of three (two girls and a boy), a few grains of the salt several times daily, for some time previous, as a prophylactic against diphtheria, as the disease was then prevailing to an alarming extent in a malignant form. On Tuesday morning, Nov. 6th, 1877, between 10 and 11 o'clock, the children were left alone in a room in

the upper portion of the house, playing, while the father and mother were in the lower part, attending to their regular household affairs. The child called Nellie took the tin box from the bureau, containing the chlorate of potassium in the crystalline form, and began playing "Doctor," in imitation of her father. She gave the salt to her brother and sister, and at the same time, as near as can be estimated, ate about half an ounce herself. It is to be wondered at that a child only two and a half years old could eat so much of the salt, as it is anything but pleasant to the taste in such quantities; but being accustomed to its use and in a state of excitement, playing "Doctor," she ate it without observing its taste. Towards the last the children were perfectly quiet, making no alarm until little Nellie began to vomit; but, as the parents had no idea as to the quantity taken, and as no dangerous or serious symptoms were exhibited, and the doctor was not aware of the fatal case of poisoning on record, there was no occasion to feel alarmed. About an hour subsequently the doctor administered diluents freely, with the object of dissolving the salt; the child began to vomit violently, throwing off about one drachm of potassium chlorate, apparently in the same crystalline form as when taken, and continued vomiting until death ensued, about 5.30 P. M., making precisely seven hours from the time the salt was taken. Beside the emetic also hydro-cathartic effects were observed, the child dying of gastritis, or inflammation of the stomach, notwithstanding Dr. Dreher and the father did all in their power to save poor little Nellie.

This case teaches us to be very careful in using chlorate of potassium, keep it out of the reach of children, and even under lock and key; under no circumstances whatever should it be given in the crystalline form, as it seems to be a violent irritant to the mucous membrane of the stomach, and by not being readily soluble (it requires sixteen parts of water, at 60°F.), cannot easily be discharged, as was proven in this case. The child was given as much water and cream as she could drink, and to the last she vomited crystals of the chlorate.

Another peculiarity of the case was the strong inclination of the child to slumber, it being in a lethargic condition from the time it was first noticed until she expired. She gave no indications of pain, but was apparently in a stupor all the time. She had taken no other medicine for months, neither was she laboring under any disease, but was a fine, hearty and well-developed child. There was no other medicine

exposed in the doctor's house, all others being out of reach, so that she could not have taken any other kind.

After the above was written, in conversation with one of our leading physicians, I was informed that he had a patient (a young man, eighteen years old) suffering from sore throat, and chlorate of potassium was prescribed in five-grain doses. From the time the first dose was taken until the medicine was stopped the patient was suffering from gastritis, vomiting freely after each dose. When they ceased administering the medicine the patient recovered from the attack of inflammation of the stomach, thus proving conclusively that the chlorate was the cause of the trouble.

POTASSIUM, SODIUM and AMMONIUM SALICYLATES.

BY NATHAN PENNYPACKER.

Read at the Alumni Meeting, February 7, 1878.

Salicylic acid is dibasic, forming acid and neutral salts; but the neutral compounds with sodium, potassium and ammonium have not yet been obtained, and none but the acid compounds of the other elements were known previous to 1855.¹

The great difficulty in making the compounds of salicylic acid with alkalis is found in the tendency of the solutions to become dark on exposure to air. This can in great part be obviated by mixing a portion of the acid with water, and without the aid of heat, adding the acid potassium or sodium carbonate so long as there is effervescence, or ammonium hydrate in slight excess, evaporating rapidly to dryness, dissolving in alcohol, pouring off the clear liquid, and evaporating it to dryness. The result in every case will be a fine white crystalline powder.

To insure success too long exposure to the air must be avoided, and the liquid must be clarified by decantation rather than by filtration, as by the latter process the solution becomes dark colored, either from exposure or from the organic matter in the filter.

The evaporation must be conducted on a water-bath, as at a higher temperature there is danger of decomposition, with formation of phenol. The advantages claimed for the use of the carbonate instead of

¹ Salicylates of the alkalis were described by Procter and Cahours as early as 1843.—EDITOR.

the hydrate, in the formation of the potassium and sodium compounds, is because the acid can be neutralized with a carbonate, which it is impossible to do with the hydrate, as the product should be acid to test-paper, and if the hydrate is added until neutral there will be an excess of it uncombined. Besides, this does not admit of purification by treating with alcohol which leaves any excess of carbonate undissolved, but takes up the hydrate.

FORMIC ACID.

BY E. GAILLARD, PH.G.

(Read at the Pharmaceutical Meeting, February 17.)

Having occasion to prepare some formic acid for medicinal purpose, I was led to read up the literature on the subject, finding that carbon was its first element, one that helps to make up the great bulk of the vegetable and animal creation, and in connection with hydrogen, oxygen and nitrogen constitutes the organogens, that is organ producers. By a little dexterous manipulation a long series of compounds are formed, adding atom to atom until the numbers that represent their chemical constitution are high among the tens, and even into hundreds. The law of their relation is as clear as that of an arithmetical progression. There exists a series of organic acids of which formic is the first, and to the members of which an atom of carbon and two atoms of hydrogen are added to form the next succeeding in the list.

Formic acid,	. . .	CH_2O_2	Butyric acid,	. . .	$\text{C}_4\text{H}_8\text{O}_2$
Acetic acid,	. . .	$\text{C}_2\text{H}_4\text{O}_2$	Valerianic acid,	. . .	$\text{C}_5\text{H}_{10}\text{O}_2$
Propionic acid,	. . .	$\text{C}_3\text{H}_6\text{O}_2$	Capronic acid,	. . .	$\text{C}_6\text{H}_{12}\text{O}_2$

and so on till we get up to melissic acid, $\text{C}_{30}\text{H}_{60}\text{O}_2$, which bears a resemblance to cerotic acid, $\text{C}_{27}\text{H}_{54}\text{O}_2$, the soluble portion of beeswax.

These and similar are only examples of the slight of hand at which carbon is an expert among the elements, as is likewise evidenced in the following derivatives of starch :

Starch,	. . .	$\text{C}_{12}\text{H}_{20}\text{O}_{10}$	Alcohol,	. . .	$\text{C}_2\text{H}_6\text{O}$
Grape sugar,	. . .	$\text{C}_{12}\text{H}_{24}\text{O}_{12}$	Acetic acid,	. . .	$\text{C}_2\text{H}_4\text{O}_2$

A little water or the hydrogen and oxygen thereof is added to the starch, and we have sugar. Dissolve the sugar, ferment it, and alcohol and carbonic acid are the result. Dilute the alcohol and ferment

again, acetic acid and water make their appearance. This wonderful metamorphosis of these carbon compounds occurs in the cells and tissues of plants and animals. Acetic acid is found in small quantities in juices of plants and animal fluids.

Formic acid exists in red ants, and by making them travel over moistened litmus paper it will redden from the acid secreted by them; hence the name of formic acid from the Latin *Formica*. For preparing the acid the process known as Bertholet's was employed, and proved satisfactory. Oxide of carbon is produced from oxalic acid, and transformed into formic acid under the influence of water.

Place into a retort 250 parts of syrupy glycerin, 38 to 50 parts of water, and 250 parts of oxalic acid; heat up to 100°C . The oxalic acid is destroyed, evolving carbonic acid, while all of the oxide of carbon combines with the elements of water. After ten hours all the oxalic acid is decomposed, and a small quantity of water charged with formic acid has distilled over; the glycerin and the largest part of formic acid remain in the retort. Add 8 parts more water, and distil at the temperature of 120°C ., adding water as long as the distillate is acid. The glycerin remains intact, and can be used over. It retains the formic acid from the water, and can be heated without fear.

This acid is colorless, sour and of a pungent taste.

NOTE ON HYDROBROMIC ACID.

By EDWARD R. SQUIBB, M.D.¹

The potassium salt is, of all the bromides, the most commonly used, and its doses to obtain given effects are best established. Hence if this salt be used as a standard for hydrobromic acid as it is for other bromides, and the acid be adjusted in strength so as to bear some easily remembered relation of its bromine constituent to the potassium salt, a base or starting point would be established for its general and accurate use, whether the bromine, when combined with hydrogen, should prove more active than when combined with potassium or not. Then as the potassium salt contains, in round numbers, say 68 per cent. of bromine, a solution of hydrobromic acid containing also 68 per cent. of bromine would have the same bromine value, though not necessarily

¹ From a paper read before the Medical Society of the State of New York, and communicated by the author.

the same bromine effect in medicine. But an acid of this strength would be unnecessarily difficult to make and to dispense. The next most simple relation is to have an acid of half the bromine strength of the salt, or 34 per cent. Such a strength can be made, kept and dispensed without unusual difficulty, and represents the bromine of the potassium bromide in the proportion of about 2 to 1, a relation easily remembered, and convenient in use. Therefore this strength has been adopted as a proper and convenient one, and the quantity of such an acid equal to the bromine of 20 grains of potassium bromide would be 40 grains, though the equivalent dose might be smaller to produce a given effect, should bromine when combined with hydrogen prove more active than when combined with potassium.

The formula and process for making an acid of this strength are as follows :

Take of Potassium Bromide,	Six parts.
Sulphuric Acid, s. g. at $15.6^{\circ}\text{C.}=60^{\circ}\text{F.}$ }	Seven parts.
1.838, at $25^{\circ}\text{C.}=77^{\circ}\text{F.}$ 1.828.	Nine parts.
Water,	

Add to the sulphuric acid one part of the water and cool the mixture. Then dissolve the potassium bromide in six parts of the water by means of heat, supplying the loss of water by evaporation during the heating. Pour the diluted sulphuric acid slowly into the hot solution with constant stirring, and set the mixture aside for 24 hours that the sulphate of potassium may crystallize. Pour off the liquid into a retort, break up the crystalline mass, transfer it to a funnel, and having drained the crystals, drop slowly upon them two parts of the water so as to displace and wash out the acid liquid. Add the liquid thus drained off and washed out, to that in the retort, and distill the whole nearly to dryness, or until nothing further distills off by moderate heating. The distillate will weigh about ten parts and should contain about 37 per cent. of hydrobromic acid. Assay this by means of normal volumetric solution of soda, and add distilled water until it shall have the strength of 34 per cent. of hydrobromic acid. The product will weigh about eleven parts, and the loss of hydrobromic acid as calculated from the potassium bromide will be about 1.2 per cent.

Solution of hydrobromic acid thus prepared is a limpid, colorless, odorless liquid, having a strongly acid taste. At $15.6^{\circ}\text{C.}=60^{\circ}\text{F.}$ it has a s. g. of 1.274. At $25^{\circ}\text{C.}=77^{\circ}\text{F.}$ the s. g. is 1.257 both com-

pared with water at $15.6^{\circ}\text{C} = 60^{\circ}\text{F}$. It is free from sulphuric acid, or gives but an unimportant trace when tested with solution of baric chloride; and is free from sulphurous acid when tested by its action on pure zinc yielding a gas which does not blacken paper moistened with solution of plumbic acetate. It leaves on evaporation no residue, or but an accidental trace.

It consists of about 33.4 per cent. of bromine, about 0.6 per cent. of hydrogen, and 66 per cent. of water; or, of 34 per cent. of hydrobromic acid, $\text{HBr} = 81$ and 66 per cent. of water. Its formula is $(\text{H} = 1 + \text{Br} = 80 =) \text{HBr} = 81 + \text{Aq}$.

In making this acid on a scale suited to the physician or pharmacist each part in the formula may be represented by 28.35 grams = 1 ounce avoirdupois, and the process answers very well upon this scale, yielding about 360 grams = 12.47 ounces.

Tared beakers, a retort about double the capacity of the liquid, with a strip of wire cloth around it where the heating flame is applied, and a small Liebig's condenser, are necessary for this process, and in the distillation here, as indeed everywhere, the lamp flames should be applied to the side of the retort.

If the mixture of sulphuric acid and water be not cooled it causes spattering and loss when poured into the hot solution of the bromide. In dissolving the bromide in an equal weight of water by heating, there is loss of water by evaporation, and unless this loss be made up it will not be practicable to get a perfect solution. But an entirely perfect solution is not essential, provided the undissolved portion be in a finely divided state, for when the diluted sulphuric acid is poured slowly in with stirring any small proportion of the bromide will be dissolved by the additional amount of liquid, and by the stirring. After standing 24 hours the lower part of the vessel will be occupied by a mass of crystals of large size, easily broken up to drain and wash. The quantity of sulphuric acid taken for the process appears disproportionate, being in excess of the quantity necessary to form acid potassium sulphate; but unless such excess be taken the salt will not crystallize out as completely, and then the distillation will be defeated when only about half finished by bumping in the retort. Smaller proportions of acid were successively tried, and when bumping occurred the process was stopped, and the contents of the retort were turned out, cooled and the crystals separated, drained and washed, but this is troublesome

and entirely unnecessary if the larger proportion of acid be used, for then almost the whole of the salt crystallizes out, rendering the process easy when it would be otherwise either troublesome or entirely impracticable. Near the close of the distillation the heat must be kept moderate, because if increased much, sulphuric and sulphurous acids are liable to be distilled over, in considerable quantities. The minute quantities of both which do go over, even in a well managed distillation, are probably thrown over mechanically by the bursting of bubbles on the surface of the boiling liquid. The quantity of either in the distillate of a well managed distillation is but a trace, and so small as to be unimportant. But should it be desired to have the distillate entirely free from these acids, a very small quantity of barium hydrate must be added and the whole be re-distilled. In the distillation the hydrobromic acid comes over comparatively weak at first, the strength gradually increasing to about 47 per cent., hence the distillate should be well stirred before being tested or assayed.

In testing for sulphurous acid it is only necessary to put a small piece of pure zinc into a test tube, pour upon it a few drops of the acid, push into the upper part a loose wad of cotton wool, and lay the paper moistened with solution of plumbic acetate on to the cotton wool.

The assays and adjustment of strength are conveniently and easily made as follows: The atomic weight of HBr being 81, a half of the tenth part of this number, namely, 4.05 grams, is weighed off, and normal sodium solution is dropped into it from a burette to the point of saturation as ascertained by means of a small piece of litmus paper kept floating in the acid as it is stirred during the dropping in of the volumetric sodium solution. Usually 18 to 19 cc. of the volumetric solution is required for saturation. Then, as only half of 8.1 grams was taken for the assay, this reading from the burette must be doubled, and therefore indicates 36 to 38 per cent. as the strength. Then weigh the distillate again, and add to it 5 per cent. of its weight of its distilled water and again assay it as before. By calculation from the quantity of water used to reduce it to this new strength, the additional quantity of water necessary to reduce it to the 34 per cent. required is easily found. When this shall have been added, and the whole well stirred, a final assay should be made to verify the result.

This acid, in common with all the others, should be dispensed by

weight. A troyounce of it contains almost exactly 400 minims ($401.48+$), and the fluidounce, of 480 minims, weighs almost exactly 574 grains ($573.86+$). A drachm of it, therefore, would contain 50 minims, and would be the bromine equivalent of 30 grains of potassium bromide. A gram of the acid is equal to 12.86 minims, and therefore 4 grams would be 51.44 minims, equal to 30.86 grains of the potassium bromide, a very large sedative dose.

The acid is not very easily administered in full doses in consequence of the large dilution necessary, and the disagreeable effect of "setting the teeth on edge." A dose of 50 grains, equal to 41.66 minims, and to 25 grains of potassium bromide, requires not less than 8 fluidounces of dilution, and the dilution must contain not less than an ounce of sugar or two ounces of syrup, to make it easily drinkable. This will be found to be the principal drawback to the use of the acid, unless it shall be proved to be effective in smaller quantities than its equivalence to the bromides indicates. And this effectiveness in much smaller doses is not only probable, but almost certain, if the experience of Fothergill and others may be trusted, since they give it in doses of one-eighth to one-fourth of those here indicated as being the bromine equivalent of potassium bromide. That is to say, the doses advised by those who appear to have used it with the best effects are equivalent to about 6 to 8 grains of potassium bromide. This published experience would make the average dose of the acid here described, say about 12 to 16 grains, or the bromine equivalent of only 6 to 8 grains of potassium bromide. In the very limited experience of physicians around the writer these doses are too small, and 20 to 30 grains, equal to 10 to 15 grains of potassium bromide are needed for a prompt sedative effect, while 40 to 50 grain doses are not uncommon; and such doses have to be repeated at times in controlling the headache, etc., of quinism. Even such doses require a dilution of 2 to 4 fluidounces of water for easy administration.

If 60 grains=50 minims of the acid here described be added to 1140 grains of syrup the mixture will measure 2 fluidounces, and weigh ($60+1140=$) 1,200 grains. Each 75 grains of this, 1 fluidrachm, will contain 4 grains nearly, or a little more than 3 minims of the acid; and 4 fluidrachms of this, equal to 15 grains of the acid when diluted with ice water to 2 to 4 fluidounces makes a dose which is easily adminis-

tered and probably effective. Such a dose is equal to 12.5 grains of potassium bromide.

Besides the administration of single doses for temporary sedative effect, it will, however, doubtless come into occasional use for a more prolonged and permanent effect as a partial substitute or alternate for the bromides to correct or prevent alkaline saturation. The doses for such continuous uses do not seem to have been ascertained, for no instance of bromism from its use has been published so far as this writer has seen. Therefore, as bromism must be the test of effective quantity the doses must be considered as unsettled. If the bromine, as present in this acid, should prove capable of producing bromism in much smaller quantity than that present in the bromides, as seems to be foreshadowed in its use up to this time, then an important advantage will have been gained, and the doses of the acid will be correspondingly smaller. At present it appears that for continuous use as a substitute for the bromides, to be continued through several weeks or until the bromides can be resumed, doses of 20 to 30 grains might be sufficient. It may also be found that by adding smaller quantities of the acid to reduced doses of the bromides the alkaline saturation might be postponed or avoided. For example, where an epileptic may be taking 25 grains of potassium bromide three or four times a day, it may, and probably will, be found that the dose of bromide can be reduced to 20 grains or less by adding one, two or three grains of this acid to the smaller dose. Such uses as this for the acid are well worth careful trial, and in such quantities it can be easily administered.

The acid will also undoubtedly prove very useful for making solutions of various bromides extemporaneously. For example, lithium bromide should, by its composition, be very useful in medicine, as the salt contains nearly 90 per cent. of bromine, or more bromine and less base than any other neutral salt possible. This is easily made, simply by saturating the acid with lithium carbonate, and adjusting the volume of the solution to the dose required.

Many formulas have been published for making this acid for medicinal uses, but all so faulty and inaccurate or so difficult as to be impracticable for ordinary use where any moderate degree of precision in medication is required.

That of Forthergill was among the earliest, and has been by far the most used. It is given in his "Handbook of Treatment," Amer.

edition of 1877, p. 569. The formula is loose and inaccurate, containing a considerable excess (161 grains) of potassium bromide. Its quantitative defects are easily remedied, but it yields a complex solution containing much tartaric acid and potassium, and is otherwise objectionable, having all the faults of the process upon which it is modelled, namely, the process for hydriodic acid by Buchanan, of Glasgow. Made by Fothergill's formula it will commonly contain between 8 and 9 per cent. of the hydrobromic acid, and as the dose is stated at "3ss. to ʒi," if this be by weight as it is written, it will be equivalent to 4 to 8 grains of potassium bromide only.

Fothergill's process was very much improved by Mr. Charles Rice ; see "New Remedies" for April 16, 1877, p. 107. But this preparation, though much more definite, is still liable to the objection of containing much tartaric acid and potassium, and therefore of being difficult to identify or verify, or to discriminate by tests or by assay.

Much better results are obtained by the original process of Balard, particularly as modified by Prof. J. M. Maisch. See "Proceedings of The Amer. Pharm. Asso." for 1860, p. 220, or as still farther modified by Prof. G. F. H. Markoe, see "Proceedings of The Amer. Pharm. Asso." for 1875, p. 686. But these and many other published processes are less simple and easy than that here proposed.

That here given is not original with the writer, but is alluded to in all standard works on chemistry ; but, without the variation in quantity of sulphuric acid used, and without crystallizing out the potassium sulphate before the distillation, the process is impracticable, or at least has always proved to be so in the writer's hands, and in the hands of all whom he has known to have tried it.

Brooklyn, Jan. 12, 1878.

ON THE VERATRUM ALKALOIDS.

BY ALEXANDER TORIEN.¹

This interesting essay, of which we can publish only a brief abstract, opens with a historical introduction citing the literature of the chemical investigations made with different species of veratrum. The poisonous properties of veratrum album were known in Spain in the

¹ Beiträge zur Kenntniss der Veratrum Alkaloide. Inaugural-Dissertation. Dorpat, 1877, 8vo, pp. 38. Communicated by the author.

sixteenth century, the rhizome being called *de balestera* or *de jerva*, and it is possible that the *charbak abjad* of the Arabian physicians was the same drug. Since veratrum is not indigenous to Greece, the helleboros of the ancient Greeks was most likely not identical with the former.

Pelletier and Caventou examined *Ver. album* in 1819, and announced the presence of veratria. In 1837, Edward Simon corroborated the presence of veratria, and found another alkaloid which he called *barytin* (from its behavior to sulphuric acid), changing the name afterwards to *jervia*. H. Will ("Ann. der Phar." xxv.) examined *jervia*, and from his elementary analysis gave it the formula $C_{60}H_{45}N_2O_5$, which was changed by Limpricht ("Grundriss d. Org. Chem.," 1862) to $C_{60}H_{46}N_2O_6$. In 1842 A. Weigand confirmed the presence of veratria and *jervia* in *Ver. album*. The same results were arrived at by Herm. Weppen, in 1872, and in the same year Schroff, Jr., announced the presence of veratria in *Ver. Lobelianum*, while Dragendorff, in 1871, found the second alkaloid (beside *jervia*) to differ from veratria, and subsequently announced the presence of *jervia* also in *Ver. nigrum*.¹

The author first examined the rhizomes of *Ver. Lobelianum*, partly collected from wild plants in Austria, partly from cultivated ones in Russia, in both of which Dragendorff had already found notable quantities of veratroidia. The process adopted was as follows:

Two kilos of the coarsely powdered rhizome were mixed to a soft mass with sufficient water containing 36.8 grm. phosphoric acid, sp gr. 1.23, macerated for 24 hours, mixed with 7.5 kilos alcohol of 95 per cent., the mixture digested in a water bath for 8 hours, cooled and expressed; and the press cake similarly treated with 12 kilos alcohol of 70 per cent. and 15 grams phosphoric acid. The united liquids were filtered, the alcohol distilled off in vacuo, the residue concentrated to a syrupy consistence, mixed with 3 times its weight of water, the resin filtered off after several hours and the filtrate rendered alkaline by sodium carbonate. The precipitate was separated from inorganic salts by solution in alcohol, the filtrate diluted with an equal part of water, digested with recently ignited animal charcoal, and the faintly wine-yellow filtrate evaporated, when a yellowish crystalline mass, *A*, was

¹ The literature on the investigation of *Ver. viride* is given in full. We omit it here, since our readers are familiar with it from the papers of Ch. L. Mitchell ("Proc. Am. Phar. Assoc.," 1874), Chas Bullock ("Amer. Jour. Phar.," 1875, p. 449) and Prof. Wormley ("Ibid.," 1876, p. 1).

left. The alkaline filtrate from the above precipitate was agitated with chloroform, this solution separated and the chloroform evaporated, leaving an amorphous light-yellowish residue, *B*.

A proved to be jervia, containing some veratroidia, while *B* was a mixture of veratroidia with some jervia. *A* was dissolved in dilute acetic acid, filtered and mixed with dilute sulphuric acid until a distinct turbidity appeared. The yellowish-white granular precipitate, collected after several hours, was jervia sulphate not yet quite pure. The filtrate was rendered alkaline by ammonia and agitated with chloroform which left but a slight amorphous pale-yellow residue.

B was contaminated with wax, and contained so little jervia that its solution in acetic acid gave no precipitate with sulphuric acid; through an accident it was lost.

The resin collected as above from the concentrated liquid, after dilution with water, still contained alkaloid. To obtain this, Bullock's method ("Amer. Jour. Phar.," 1876, p. 147) was tried with indifferent success. The powdered resin now mixed with an equal weight of lime, enough water was added to produce a soft mass, and this dried at 40°C (104°F.) From the powdered lime resin soap the alkaloid could be extracted with ether, but hot 85 per cent. alcohol was also found serviceable. The alcohol was partly distilled off, then dilute acetic acid added and all alcohol evaporated; the filtrate was treated with sodium carbonate, the precipitate *C* washed, freed from lime by dissolving in alcohol, and this solution evaporated.

The alkaline filtrate from *C* was agitated with chloroform, which, on evaporation, left an amorphous light-colored residue, consisting of veratroidia with a little jervia.

C, consisting of veratroidia with larger quantities of jervia, was dissolved in dilute acetic acid, the solution divided into three parts, which were precipitated respectively with muriatic acid, sp. gr. 1.2, nitric acid, sp. gr. 1.13 and diluted sulphuric acid (1 to 7 water). The filtrates were mixed and marked *D*, the brown-red soft granular precipitates were, after Bullock's recommendation, freed from resin with 95 per cent. alcohol, and the residue dissolved in boiling strong alcohol, previously diluted with an equal part of water. The filtered solutions left on spontaneous evaporation, crystals agreeing with those figured by Bullock and by Wornley (*loc. cit.*)

Pure jervia was obtained from the nitrate by treating it with a warm

solution of sodium carbonate, and purifying the alkaloid with strong alcohol, when it formed perfectly white needles, which, by ultimate analysis gave results, leading to the formula $C_{13}H_{23}NO_4$, or more closely to $C_{27}H_{47}N_2O_8$ ($O=16$). The sulphate and hydrochlorate have the composition $C_{27}H_{47}N_2O_8, H_2SO_4$ and $C_{27}H_{47}N_2O_8, HCl$.

The acid filtrate *D* was precipitated with sodium carbonate, and the precipitate freed from jervia, as recommended by Bullock, by dissolving in acetic acid, and treating with potassium nitrate; the filtrate was rendered alkaline by sodium carbonate and agitated with chloroform; a small quantity of light yellow amorphous veratroidia was obtained, having the following reactions:

Concentrated sulphuric acid gave a yellow solution, passing through light brown-red into deep raspberry red.

Concentrated muriatic acid yielded a light yellowish rose-red solution, which, on heating, became dirty yellow, and with sulphuric acid and heating brown-red.

Concentrated nitric acid produced a light yellow solution, which, with sulphuric acid and on being heated, turned transiently orange red and passed into lemon-yellow.

The author observed that small quantities of veratroidia, also of veratria, will materially modify the reaction of jervia, and commercial jervia seems often to contain one or both of these alkaloids. Veratroidia is dissolved by cold concentrated muriatic acid with a pale rose-red color, which, when heated, is rapidly discolored. Veratria, on the contrary, dissolves in cold muriatic acid colorless, an intense and lasting red coloration being produced by heat, and this is likewise the case with sabatrina and sabadillia.

Veratroidia is rather freely soluble in water, freely in alcohol, ether and chloroform, little in petroleum ether (gasolin), somewhat more in benzin and amylic alcohol. It dissolves in water to about the same extent as sabadillia, less than sabatrina and more freely than veratria; it differs from sabadillia by its greater solubility in ether.

The two alkaloids, jervia and veratroidia, were also found in cultivated old and recent rhizomes, and in the young leaves of *Veratrum Lobelianum*, and in the dried rhizome of *Ver. album*, which yielded little jervia and more veratroidia.

Jervia is very sparingly soluble in water and in solution of sodium carbonate, freely in alcohol and in chloroform, less in amylic alcohol

and benzin, very little in ether and almost insoluble in petroleum. When pure it is dissolved by concentrated sulphuric acid with a yellow and finally light-green color. Concentrated muriatic and nitric acids cause no change in the color; but muriate of jervia, thrown into concentrated nitric acid, produced an evanescent rose color. Potassium nitrate indicates jervia already when in dilution of one in 1200.

The elementary analyses of veratroidia points to the formula $C_{51}H_{78}N_2O_{16}$ or $C_{24}H_{37}NO_7$. Its action upon frogs is similar to veratria, but much more energetic than either sabadillia or sabatrina.

The composition of the above alkaloids, as ascertained by Weigelin and Tobien, is the following :

Veratria,	$C_{52}H_{86}N_2O_{15}$, <i>W.</i>	Sabatrina,	$C_{51}H_{86}N_2O_{17}$, <i>W.</i>
Veratroidia,	$C_{51}H_{78}N_2O_{16}$,	Sabadillia,	$C_{41}H_{66}N_2O_{13}$, <i>W.</i>
or	$C_{24}H_{37}NO_7$, <i>T.</i>	Jervia,	$C_{27}H_{47}N_2O_8$, <i>T.</i>

Even if the molecular values of the formulas should, on further investigation, be altered, this is evidently a natural group of alkaloids, somewhat similar to those of opium and cinchona. The first four show a great similarity in their behavior to sulphuric acid; but with sugar and sulphuric acid, pure veratria yields a green, afterwards blue coloration, while veratroidia gives a black-brown color, which lasts for some time.

Veratria, sabatrina and sabadillia agree in their behavior to muriatic acid; but veratroidia and jervia differ very widely from it. In their action veratria, veratroidia and perhaps jervia are nearest related to each other; but the latter is distinctly characterized by its behavior to sulphuric, muriatic and nitric acids.

M.

FERRUM ALBUMINATUM SOLUTUM.¹

By C. BERNBECK.

Dr. Triese, of Illingen, near Saarbrücken, has added a very valuable and therapeutically important preparation to the *Materia Medica* by publishing a formula for the preparation of *Ferrum albuminatum* in the "*Berliner Klinische Wochenschrift*." His formula reads as follows: Mix the white of an egg intimately with 10 grm. liq. ferri sesquichlorati by triturating them in a mortar; remove the excess of chlo-

¹ Translated by L. v. Cotzhausen from "*Archiv der Pharmacie*," Dec., 1877.

ride of iron by washing with distilled water, and redissolve, by macerating for two days, the precipitate in half a liter of distilled water, previously acidulated with 12 drops of pure hydrochloric acid.

Numerous experiments made by me proved that only in the following manner, by carefully avoiding an excess of hydrochloric acid in the ferric chloride, a preparation may be obtained answering to the description given by Dr. Triese. It is well known that the officinal liquor nearly always contains an excess of hydrochloric acid, which in the preparation of ferrum albuminatum will cause a solution of the greater portion of the precipitate, which will then necessarily go to waste by washing. This loss is avoided by using a neutral ferric chloride obtained in the following manner: Dissolve 6 parts of dry ferric chloride obtained by evaporating the officinal liq. ferri sesquichlorati, in 10 parts of distilled water, filter and mix the filtrate intimately with 20 parts of the white of eggs; place the brownish-yellow magma on a moistened strainer, press well with the hands and repeat it several times, after the addition of a little distilled water, until the excess of chloride of iron is removed. Dissolve the residue in $\frac{1}{2}$ liter of distilled water, acidulated with 12 drops of hydrochloric acid, by macerating for one or two days, and filter.

Dr. Triese administers this preparation in chlorosis without the addition of phosphorated ether; it must, then, always be freshly prepared. As a remedy for rhachitis he prescribes an addition of 12 drops of a solution of 0.05 grm. phosphorus in 30 grm. of ether to 250 grm. of the iron albuminate solution, which keeps the latter unaltered for at least six weeks, and permits it to be kept on hand for that length of time.

ON THE ORIGIN OF TRAGACANTH.¹

By M. GIRAUD.

The formation of gum in plants seems to depend upon a peculiar morbid condition, the main phases of which were investigated and described by Trécul in 1860. Although he studied the formation of gum only in the Rosaceæ, it has been taken for granted that a similar process yields the gum of the Acaciæ, which, being an article of commerce, is of much greater importance. The gum-disease is caused by a fullness of sap in the young tissues, whereby the new cells are softened

¹ Translated from "Archiv d. Phar.," Dec., 1877, by L. v. Cotzhausen.

and finally disorganized. Thus cavities are formed filled with liquid containing the fragments of the destroyed tissues. The cavities gradually increase in size in consequence of the disintegration of the neighboring cells, and whenever they occur near the epidermal layers they may force an opening through them, and thus cause larger or smaller fissures; but if they remain enclosed on all sides they become receptacles of gum. This gum near the walls of the cavity appears in the shape of gelatinous warts, which grow, turn yellow or brown, and finally fill up the hollow space. When near fibres, it appears first to exude from them, and gradually to alter them together with their contents. If the cavities occur near the bark, or near soft woody tissue, their contents occur in the well-known shape of transparent tears.

This is the origin of the gums in the *Rosacæ* and *Acaciæ*, which consist mainly of gummic or metagummic acid. Tragacanth differs from these gums both in its origin and properties. Hugo v. Mohl considers it likewise as a pathological product, having some similarity with the other gums, and to be the result of a more or less complete transformation of the cells of the pith and of the medullary rays, into a gelatinous substance, which swells by the imbibition of water to several hundred times the size of the original cells. On examining the anatomical structure of the *Astragali* furnishing this substance we find that the pith and medullary rays have changed more or less and all the intermediate stages in this gradual transformation are observable. The cells, which originally assumed a hard, horny consistence, without altering their shape, ultimately condense into a homogeneous mass, in which the cell walls are no longer perceptible. This seemed to confirm the opinion of Guibourt, that the soluble portion of tragacanth consists of arabin and the insoluble portion of a mixture of cellulose and starch, both partly altered. But this view is as little exact as the statement generally met with in the books, that the soluble portion differs from arabin in not being thickened by ferric salts, and that after precipitation by alcohol it possesses a peculiar mucilaginous consistence. The portion insoluble in hot water was called bassorin, and stated to have the general constitution of amylaceous substances, to differ greatly from cellulose, and to be characterized by swelling greatly in water.

Guibourt mentions starch as a constituent and others have observed the same, and that vermiform tragacanth contains more than the flakes; the manner in which tragacanth forms, according to Mohl, would

easily explain the presence of starch. But, evidently, if the recognition of such an easily recognizable body has been so difficult, it is even more so to recognize the nature of the main constituent which imparts to tragacanth its principal properties. Indeed, much confusion has existed on this point, and we are therefore the more rejoiced at meeting with researches by Giraud, by which an unexpected light is shed on it.

If, says the author, 1 part of tragacanth is digested in 50 parts of water, containing 1 per cent. of hydrochloric acid, the liquid filtered and then mixed with baryta water in excess, the gradually deposited precipitate will consist of pectate of barium. If this is collected, washed, diffused in water and then treated with muriatic or acetic acid, the base will dissolve, while the residue will consist of pectic acid. In this manner tragacanth will yield 60 per cent. of pectic acid. The process described shows plainly that pectic acid does not pre-exist in tragacanth, but is formed from some other substance. Giraud explains as follows:

1. A very small percentage of tragacanth only is soluble in cold water, not 30 to 50 per cent., as is sometimes stated. The soluble portion is not a substance similar to arabin, but a mixture.

2. If tragacanth is digested, in a water-bath, with 50 times its weight of water, the entire gummy constituent is transformed into a soluble gum, which after having been dried will not swell. The new product is not arabin, but pectin.

3. By subjecting this principle, with water containing 1 per cent. of acid, to the heat of a water-bath for two or three hours, it becomes entirely soluble, but still consists mainly of pectin, and, though precipitated by alcohol, is not gum, as usually stated. Sugar, formed simultaneously, amounts to scarcely one-tenth of the substance employed.

These experiments show that tragacanth is transformed by these processes into pectin, which is soluble in water, precipitated by alcohol, and by alkalies converted into pectates and metapectates. The pectin is generated from an insoluble pectinous principle, which constitutes more than one-half of the tragacanth, and is apparently identical with Frémy's pectose.

It is well known that pectose occurs largely in the tissues of many fruits and roots; it accompanies, nearly always, cellulose, with which, however, it cannot be confounded; for by the action of acids cellulose

is transformed first into dextrin and afterwards into sugar, but never into pectin.

Giraud's observations, it will be seen, contradict Mohl's views, according to which the cellulose of the *Astragali* is transformed into tragacanth.

The author has found tragacanth to have the following average composition: 20 water, 60 pectinous principle, 8 to 10 soluble gum, 3 cellulose, 2 to 3 starch, 3 per cent. of mineral constituents and traces of nitrogenated matter.

SCHEME for the RECOGNITION of the more Important RESINS, GUM RESINS and BALSAMS.¹

By EDWARD HIRSCHSOHN.

In continuation of the author's researches on ammoniacum, galbanum, sagapenum and opoponax, previously published, he has made a comparative examination of a large number of the more important resins, gum resins and balsams. The results have been published in an inaugural dissertation written upon attaining the grade of "magister der pharmacie." This thesis contains a table for the recognition of these substances by their behavior towards reagents. The following are the reagents used:

1. Sulphuric acid, sp. gr. 1.820.
2. Alcoholic hydrochloric acid, obtained by saturating 95 per cent. alcohol with dry hydrochloric acid gas.
3. Bromine solution, 1 part of bromine in 20 parts of chloroform.
4. Saturated solution of chloride of lime in distilled water at the ordinary temperature.
5. Alcoholic solution of perchloride of iron, 1 part in 10 parts of 95 per cent. alcohol.
6. Saturated solution of neutral lead acetate in 95 per cent. alcohol.
7. Solution of ammonia, sp. gr. 980.
8. Solution of pure sodium carbonate crystals in distilled water.
9. Fröhde's test: 1 centigram of sodium molybdate in 1 cc. sulphuric acid.
10. Impure chloral hydrate, containing alcoholate.
11. Saturated solution of iodine in petroleum spirit boiling at 60°C.

COMPLETELY SOLUBLE IN CHLOROFORM.

COMPLETELY SOLUBLE IN ETHER.

Ethereal solution becomes turbid after addition of alcohol.

- I. Alcoholic solution gives with perchloride of iron a turbidity that disappears on boiling. Chloral reagent colors violet—Canada Balsam.
- II. Alcoholic solution gives no turbidity with perchloride of iron.
 1. The drug is liquid and forms a clear mixture with petroleum spirit boiling below 40° C.
 - a. Bromine solution colors the chloroform solution yellowish, then violet and blue—Maranha Copaiba Balsam.

¹ "Pharmaceutische Zeitschrift für Russland," xvi, 81

b. Bromine solution produces no color—Para Copaiba Balsam.

2. The drug is solid and dissolves only partially in petroleum spirit. Iodine solution colors red-violet—Ordinary Mastic.

Ethereal solution forms clear mixture with alcohol.

I. Perfectly soluble in alcohol.

1. Perchloride of iron colors the alcoholic solution blue.

a. Lead acetate gives a precipitate with alcoholic solution. Sulphuric acid dissolves the drug with a cherry-red color—Guaiacum Resin.

b. Lead acetate gives no precipitate. Sulphuric acid dissolves the drug with a yellow-brown color—Carana Resin (*Aceyta americana*).

2. Perchloride of iron colors the alcoholic solution brownish or greenish.

a. Lead acetate gives with the alcoholic solution a precipitate that is not dissolved by boiling.

a. Sodium carbonate solution dissolves parts at the ordinary temperature. Chloral test colors the residue from the evaporation of a petroleum spirit extract gradually red-violet with blue streaks—Coniferous Balsams and Resins.

β. Sodium carbonate dissolves none or a very small quantity.

A. Petroleum spirit extract colorless. Chloral test produces no color or a very faint greenish—Bombay Mastic.

B Petroleum extract colored.

c. Dark brown. Chloral test colors brown—Mani Resin.

D. Yellow-brown. Chloral test colors gradually indistinct red violet—Carana Resin.

E. Yellow-brown. Chloral test and bromine solution color a magnificent violet—Carana hedionda.

b Lead acetate gives with alcoholic solution a precipitate that dissolves on boiling.

a. Bromine solution colors red—Peruvian Guaiacum Resin.

β. Bromine solution produces no coloration—Alexandrian Mastic.

c. Lead acetate gives no precipitate. Ammonia gives a turbid mixture—Dragon's blood.

II. Imperfectly soluble in alcohol.

1. Lead acetate produces turbidity which disappears upon warming—Brazilian Copaiba Balsam.

2. Lead acetate gives no precipitate. The drug is clearly crystalline. Sodium carbonate does not dissolve it by boiling.

a. Bromine solution gradually colors green.

A. Alcoholic hydrochloric acid colors violet, blue or brown—Elemi.

b. Bromine solution colors violet—Elemi.

c. Bromine solution produces no color—Elemi (*Amyris elemifera*).

IMPERFECTLY SOLUBLE IN ETHER.

Perfectly soluble in alcohol.

I. Sulphuric acid colors the residue from evaporation of a petroleum spirit extract cherry-red. The drug is free from cinnamic acid—Siam Benzoin.

II. Sulphuric acid does not color such residue, or only faintly brown. Contains tains cinnamic acid—Sumatra Benzoin or Tolu Balsam.

III. Sulphuric acid colors such residue yellow-brown passing into violet—Black Peru Balsam.

Imperfectly soluble in alcohol.

I. Perchloride of iron gives a precipitate, which is neither dissolved by boiling nor soluble in ether—Brazilian Copal.

II. Perchloride of iron produces no turbidity or only a slight one that disappears on boiling.

1. The ethereal solution gives with alcohol a turbid mixture.

- a. Alcoholic hydrochloric acid colors it brownish. Chloral test colors evaporation residue of petroleum spirit extract greenish—Dammar.
- b. Alcoholic hydrochloric acid colors it brick-red. Chloral test colors the petroleum spirit residue carmine-red to violet—White Peru Balsam.
2. Ethereal solution gives with alcohol a clear mixture.
 - a. Ammonia gives with alcoholic solution a clear mixture. Bromine solution colors blue—Ceradia Resin.
 - b. Ammonia gives with the alcoholic solution a turbid mixture. Bromine solution colors greenish—Mecca Balsam.

IMPERFECTLY SOLUBLE OR INSOLUBLE IN CHLOROFORM.

COMPLETELY SOLUBLE IN ETHER.

Ethereal solution red. Ammonia gives with alcoholic solution a clear mixture—Dragon's Blood from Pterocarpus Draco.

Ethereal solution yellowish or colorless.

- I. Alcoholic solution gives with lead acetate no precipitate—Podocarpus Resin.
- II. Alcoholic solution gives with lead acetate a precipitate that is not dissolved by boiling—Sandarac.

IMPERFECTLY SOLUBLE IN ETHER.

Ethereal solution becomes turbid after addition of alcohol.

- I. Alcoholic solution gives with ammonia a clear mixture.
 1. The mixture with ammonia is yellow. The solution of the resin in sulphuric acid is yellow-brown and gives with alcohol a clear violet mixture—Eryops Resin.
 2. The mixture with ammonia is carmine red—Sonora Lac.
- II. Alcoholic solution gives with ammonia a turbid mixture.
 1. Perchloride of iron colors green. The drug contains cinnamic acid. Lead acetate gives a precipitate—Liquid Storax.
 2. Perchloride of iron colors brownish or not at all.
 - a. The drug contains cinnamic acid, and gives with lead acetate no precipitate—Liquidambar Balsam.
 - b. The drug contains no cinnamic acid, and gives with lead acetate a precipitate—Euphorbia Tiocalli Resin.

Ethereal solution gives with alcohol a clear mixture.

- I. Perfectly soluble in alcohol. Perchloride of iron colors dark brown or black.
 1. Solution in alcohol is red.
 - a. Lead acetate gives no precipitate. Chloroform extract colorless—Xanthorrhœa quadrangularis Resin.
 - b. Lead acetate produces turbidity. Chloroform extract yellow—Xanthorrhœa arborea Resin.
 2. Alcoholic solution yellow. Lead acetate produces a precipitate—Yellow Xanthorrhœa Resin.
- II. Imperfectly soluble in alcohol.
 1. Alcoholic solution gives with ammonia a clear mixture.
 - a. Ammoniacal mixture is violet. Lead acetate gives a violet precipitate—Lac.
 - b. Ammoniacal mixture is yellow or colorless.
 - a. Perchloride of iron colors the alcoholic extract black. Lead acetate gives no precipitate—Gamboge.
 - β. Perchloride of iron gives a precipitate which is neither soluble in ether or by heating. Lead acetate gives a precipitate.
 - A. Readily and completely soluble in ether-alcohol.
 - c. Bromine solution precipitates the resin from the chloroform solution—Australian Copal.
 - d. Bromine solution produces no precipitate—Manilla Copal.
 - B. Imperfectly soluble in ether-alcohol—East Indian Copal. African Copal.

2. The alcoholic solution gives with ammonia a turbid mixture.
 - a. Perchloride of iron gives a precipitate that is neither dissolved by boiling nor in ether—Borneo Copal.
 - b. Perchloride of iron gives no precipitate.
 - a. Completely soluble in ether-alcohol. Chloral test colors residue from evaporation of petroleum spirit-extract blue to blue violet—Liquidambar styraciflua Balsam.
 - b. Incompletely soluble in ether-alcohol.
 - A. The drug contains sulphur.
 - c. Yields umbelliferon by dry distillation.
 - E. Hydrochloric acid colors the petroleum spirit extract residue reddish-yellow; the chloral test colors it green—Persian Sagapenum.
 - F. Hydrochloric acid colors the residue blue-violet; chloral test colors it rose color to raspberry-red and violet—Levant Sagapenum.
 - G. Not colored by hydrochloric acid. The solution of the drug in sulphuric acid is yellow brown with a blue fluorescence. Potassium nitrate colors the gum resin malachite-green—Ordinary Asafetida.
 - D. Yields no umbelliferon by dry distillation.
 - E. Sodium carbonate solution colors the drug light brown, and the extract is not altered by acetic acid or lead acetate—Asafetida from Ferula alliacea.
 - F. Sodium carbonate solution forms an emulsion that cannot be filtered.
 - H. Lead acetate gives no precipitate. Iodine solution is not altered—Indian Bdellium.
 1. Lead acetate produces immediately or after a short time a precipitate that dissolves upon warming. Iodine solution is not altered—African Bdellium.
 - B. The drug contains no sulphur.
 - c. Yields umbelliferon by dry distillation.
 - E. The petroleum spirit extract residue is colored by hydrochloric acid and the chloral test.
 - H. Hydrochloric acid colors reddish-yellow; the chloral test colors green—Persian Galbanum.
 - I. Hydrochloric acid colors red-violet; the chloral test colors greenish—Levant Galbanum as at present in commerce.
 - K. Hydrochloric acid colors violet-blue; the chloral test carmine-red—Older specimens of Levant Galbanum.
 - F. Hydrochloric acid gives no color; the chloral test colors light brown—African Ammoniacum.
 - D. Yields no umbelliferon by dry distillation.
 - E. Chloride of lime solution colors the gum resin orange-yellow—Persian Ammoniacum.
 - F. Chloride of lime solution produces no color. Lead acetate gives no precipitate.
 - H. Iodine solution is not altered; the chloral test colors greenish—Olibanum.
 - I. Iodine solution is not altered; the chloral test gives no color—Indian Myrrh.
 - G. Chloride of lime solution produces no color. Lead acetate gives a precipitate.
 - H. Bromine solution colors violet-red; the chloral test colors violet—Ordinary Myrrh.
 1. Bromine solution produces no color or only yellowish. Perchloride of iron colors green—Opoponax.
 - K. Bromine solution produces no color or only yellowish. Perchloride of iron colors brownish—Euphorbium.

VARIETIES.

The specific gravity and strength of dialyzed iron has been determined by Mr. E. B. Shuttleworth with the following results :

Sp. gr.	Pulverulent on water-bath.	Well dried on water-bath.	Exposed during one night.	Calced.
1'046	. . .	5'6	. . .	5'0 per cent.
1'040	5'5	5'0	6'0	. . .
1'038	5'2	4'7	5'6	4'3
1'034	5'0	4'3	. . .	. . .

Taking into account the liability of strong and well dialyzed solutions to become gelatinous, I think a liquor of 1'040, yielding, when evaporated and well dried over a water-bath, 5 per cent. of residue, best fitted for medicinal use. Such a solution keeps well ; it can be readily estimated by the pharmacist—a simple evaporating dish being all that is required—and, moreover, the strength corresponds as nearly as possible with that of the ordinary tincture of perchloride of iron.

A word in regard to the asserted tastelessness of dialyzed iron. I have now on hand a solution which has been dialyzing for 42 days, and is quite gelatinous ; it cannot, however, be strictly described as tasteless. Though it is not in the least ferruginous, it is slightly styptic, and produces, when applied to the tongue, an effect similar to that of astringents. This is, I think, to be attributed to the precipitation of oxide, which occurs the moment the solution comes in contact with the saliva, thus giving rise to the sensation alluded to.

Provided, then, that a solution is deprived of ferruginous taste ; that it is not distinctly *blackened* by infusion or tincture of galls, and does not give direct evidence of containing hydrochloric acid, I think the test of specific gravity may be, for common purposes, relied on.—*Canad. Phar. Jour* , Dec., 1877.

Test for Elaterin. By David Lindo.—The active principle in elaterium affords a very beautiful reaction with carbolic acid and concentrated sulphuric acid. The test may be applied as follows :

Place a few crystals of elaterin in a small porcelain capsule, and add one or two drops of liquefied crystals of carbolic acid (Calvert's No. 1, liquefied by moisture). The elaterin dissolves in the carbolic acid without production of color, but if two or three drops of concentrated sulphuric acid are allowed to flow into the mixture, an intense and beautiful carmine color is developed, changing at first to orange and after some time to scarlet. Alkalies discharge the color. I have not been able to obtain a reaction resembling this with any of the alkaloids and carbolic acid, nor with any other substance tried.¹

If liquefied crystals of carbolic acid are not at hand, the solid crystals can be used. After adding them to the elaterin add a drop of chloroform or alcohol before apply-

¹ If a nitrate in the *dry* state is treated in the same way with carbolic and sulphuric acids a deep green color is developed, which changes to red on the addition of a little water.

ing the sulphuric acid. The addition of sulphuric acid alone to elaterin gives rise to no characteristic color.¹ The elaterin cakes together, dissolves slowly and imparts a yellow color to the acid. If the carbolic acid is now added the reaction is obtained very imperfectly. The reagents should therefore be added in the order stated above. The test can be applied direct to some samples of the elaterium of commerce (dried sediment of the juice) if they are reduced to fine powder.

Other samples may require the powder to be agitated with chloroform, and the solution filtered. A few drops of the filtrate, evaporated to dryness by blowing on the surface, will afford a residue for testing.—*Chem. News*, Jan. 25.

Chrysophanic Acid in Skin Disease.—In a report of a case of psoriasis treated by chrysophanic acid, in the "Medical Press and Circular," by Dr. J. C. O. Will, of Aberdeen, he remarks :

The introduction of this new remedial agent, apparently possessing the power of effecting a cure in a short space of time, seems a real gain ; and if more extended trials are followed by equally beneficial effects, there is every reason to believe that chrysophanic acid will soon be regarded as the most reliable and quickest method of treating psoriasis.

It has one disadvantage, however, which renders its use rather objectionable in private practice, viz., that it stains the clothing of the patient and bed-clothes a purple color, which will not wash out ; but it may be reasonably expected that some means will be devised by which this may be overcome.

When prescribing chrysophanic acid, it is a wise precaution to warn the patient against allowing it to come in contact with the eyes, as it gives rise to intense irritation, accompanied by great dilatation of the pupils. This I have seen thrice—once in a case of psoriasis rupoides (at present under treatment), and twice in cases of favus, where I may mention that the acid proved useless. The irritation subsides spontaneously in the course of a few days.—*Med. and Surg. Reporter*, Jan. 12.

Carbazotate of Ammonium.—Dr. Beaumetz, of Paris, has reported, lately, six cases treated with this substance. Case 1. Quotidian ague ; recovery after four days' treatment ; daily dose, from one to two centigrams of the substance in pills. Case 2. Quotidian ague (sulphate of quinia having been given without effect): complete recovery after five days ; five pills used. Case 3. Tertian ague ; recovery after eight days ; two pills a day. Case 4. Quotidian ague ; recovery after eight days. Case 5. Facial neuralgia ; speedy recovery. Case 6. Tertian ague (sulphate of quinia has been administered during seventeen days with no result); completely cured after the administration of six centigrams (about one grain) of the salt for two days. Like quinia, carbazotate of ammonium diminishes the state of the pulse, and brings on heaviness, cephalalgia, and even delirium, and is eliminated by the kidneys. These experiments have again been repeated by Dr. Dujardin-Beaumetz, with similar results.—*Ibid.*, Jan. 5. See, also, *Amer. Jour. Phar.*, 1873, p. 221 and 232.

¹ See, however, "Am. Jour. Pharm.," 1875, p. 2.—EDITOR.

Researches on Chloral and on its Hydrate. M. Berthelot.—There is liberation of heat in the reaction of gaseous chloral upon gaseous water with formation of a gaseous compound. The gaseous hydrate of chloral exists, then, veritably as a compound, distinct from a mere mixture of the two vapors. This conclusion is conformable to the results obtained by M. Troost from the study of the tensions of dissociation. It is supported by this fact that anhydrous chloral does not combine instantaneously with water, but condenses in it first in the form of an oil which only dissolves by degrees even on agitation; whilst, on the contrary, chloral hydrate in vapor condenses under water in the state of a crystalline hydrate, if not agitated, and dissolves at once on stirring.—*Chem. News* [Lond.], Jan. 11, 1878.

To Bronze Iron Articles.—According to a process by M. P. Hess, this is done by the articles being heated in the air after being coated with linseed oil. Objects which cannot be exposed to a high temperature may be steeped in a slightly acid solution of ferric chloride, plunged in hot water, and, when dry, rubbed with linseed oil or wax. To preserve iron from rust, the author recommends sulphide of copper. He steeps the iron for a few minutes in a solution of sulphate of copper, and then transfers it into a solution of hyposulphite of soda, acidulated with hydrochloric acid. The result is a blue-black coating, not affected by air or water.—*Ironmonger*, from *Am. Gas Light Jour.*, Jan. 2.

Ink that Cannot Be Erased.—An ink that cannot be erased, even with acids, is obtained by the following receipt: To good gall ink add a strong solution of fine soluble Prussian blue in distilled water. This addition makes the ink, which was previously proof against alkalis, equally proof against acids, and forms a writing fluid which cannot be erased without destruction of the paper. The ink writes greenish-blue, but afterwards turns black.—*Amer. Gas Light Jour.*, Jan. 2, 1878, from *Ironmonger*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, February 19, 1878.

In the absence of the President and Vice-President, Prof. Remington was called to the chair; the minutes of the last meeting were read and approved. The Chairman expressed the hope that if any strangers were present they would take part in the proceedings, and extended a cordial welcome to them.

Prof. Maisch presented, on behalf of our fellow-member Mr. Thomas H. Powers, a number of volumes, many of them rare, and portion from the library of the late Dr. Jno. Redman Coxe, formerly professor in the University of Pennsylvania, with a donation to cover the expense of rebinding such as needed it; the list of the volumes was read, and included the folio volume of the treatise on the "Natural order

of Melastomaceæ," by Humboldt and Bonpland, illustrated with fine steel plates beautifully colored.

Another donation of books, amounting to about forty, mostly treatises on chemistry in the German language, was also announced by Prof. Maisch as having been received from a scientific gentleman of this city who did not wish his name mentioned. The thanks of the College were directed to be returned to Mr. Powers, and to the donor of the other set through Prof. Maisch.

The annual report of the Smithsonian Institute, for 1876, was presented from the Secretary, Prof. Henry, through Prof. Maisch.

The following donations to the cabinet were received: From Mr. Neppach, a member of the present class, a specimen of *Barberry* or *Chittem Bark* from Oregon where it is used as a tonic and febrifuge; and from Mr. Jos. Jacobs, of Georgia, a specimen of the cotton plant (*Gossypium herbaceum*) with root, stem and the cotton balls in full development.

Mr. Ed. Gaillard read a paper upon Formic Acid (see page 115), and in answer to a question, stated that he had not learned the particular purpose for which the physician wanted the acid. Prof. Maisch called attention to the *spirit of ants*, officinal in the German and other European pharmacopœias, which is merely an alcoholic solution of formic acid, but is still prepared from red ants.

Prof. Maisch stated that he was experimenting on *Bromide of Iodine*, a substance which has long been in use among photographers, in the daguerreotype process for rendering the plates more sensitive, but appears to be likewise used, to some extent, for medicinal purposes; he described it as exceedingly caustic, similar to bromine, and as evidently unfit for internal use in the concentrated state, or in large doses. Recently, through a typographical error in a medical journal, it had been directed instead of potassium bromide in a prescription for epilepsy; the error had been promptly corrected, but it seemed proper to direct attention to the caustic nature of the compound.

Mr. Charles L. Mitchell read a paper upon medicated bougies (see page 108), giving their history and describing the various kinds in use, and the advantages of this method of medication; he exhibited specimens of the bougies as made by him, and also of Reynal's porte-remède, the former being more serviceable in appearance.

The Chairman called the attention of the meeting to the collections of one hundred and seventy specimens of North American drugs and preparations made from some of them, which the College had directed to be sent to the Paris Exposition, and after the close of that exhibition to be presented to the Société de Pharmacie of Paris. At the exhibition the collection will be in charge of Mr. Lindewald, a graduate of the College.

Attention was also called to the recent purchase made by the Board of Trustees of a large balance for scientific uses, especially valuable in enabling the members to have their weights and measures adjusted to the proper standard. An examination of the weights used in another city showed such discrepancies as to render it important that an examination of the weights used by the members of our profession should be instituted at once.

Mr. Shinn was called to the chair while Prof. Remington reported on a series of experiments undertaken by Mr. L. Wolff; having a considerable demand for the

albumen of eggs, he was desirous of utilizing the yolks, and this led to the preparation of the fixed oil contained in the latter and to an attempt of isolating the *emulsifying principle*, in which Mr. Wolff had been nearly successful. As obtained, the principle will readily emulsify oil in water by simple agitation.

The use of *fixed oils*, in pharmacy, was brought forward, and among others benne oil, obtained from the seed of the *Sesamum Orientale*, was mentioned as a remarkably bland oil. Prof. Maisch stated that the chief objection to it was, that, though not a drying oil proper, it gradually became thick and ropy on exposure, and could, therefore, not be advantageously substituted for expressed oil of almonds; a sample of cold cream made by using this oil in place of oil of almonds was exhibited by Mr. Mitchell, and was considered equal to that made by the official formula excepting in color. Prof. Maisch said that it was quite a question how much of the commercial expressed oil of almonds was really such, great quantities of apricot and peach kernels were annually consumed to obtain oil from them. The test recommended by Hager will detect the substitution: equal parts of 25 per cent. nitric acid and the oil are agitated and warmed to about 120°F., when almond oil will form a white emulsion-like mixture, the other oils mentioned turning yellow or pinkish (see also "Amer. Jour. Phar.," 1877, p. 595).

A sample of so-called California rock soap had been shown at the November meeting; since that time it has been subjected to a chemical investigation by Mr. Betz in the laboratory of the College, and proves to be a silicate of alumina with traces of calcium sulphate and iron, showing that it is a species of kaolin, and owes its detergent qualities to its mechanical rather than chemical action.

Prof. Maisch showed specimens of drugs that had been presented to him, as being very beautiful, carefully prepared and of such superior quality as not often seen in the market; they were the root of *Archangelica officinalis*, the flowering herb of *Erythræa Centaurium*, or European Centaury, and Manna in very large, white flakes.

There being no further business, on motion, the meeting adjourned.

THOS. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The junior examination was held about the middle of February, 94 first course students participating. As in the preceding year, twelve specimens had been laid out for identification, and the same number of questions prepared to be answered in writing. The time allowed was five hours, of which fifteen minutes could be devoted to the examination of the specimens. The result was in the main satisfactory to the examiners. The following were the questions:

1. What is the chemical name of Chalk? State its composition and name the gas which is separated from it by the action of acids. Give the composition of this gas, its symbol, its physical and chemical properties and the method by which it may be detected.

2. What are the official names (U. S. P. and B. P.) of the solutions of Ammonia? Give the method of preparing them and explain the chemical changes which take place. State the relative strength and the specific gravity of each.

3. What forms of Sulphur are used in medicine? State their modes of preparation, the impurities they may contain, and the method of detection of the more common impurity.

4. Explain the meaning of the terms *root*, *rhizome*, *tuber* and *bulb*, and give two official examples of each.

5. What is a *berry*? A *drupe*? A *capsule*? Name several official examples of each kind.

6. Enumerate the official *leaves* which have the margin entire, and state which are of a leathery texture.

7. Define briefly the following pharmaceutical terms: Hydrometer, Elutriation, Conical Percolator, Infusion, Decoction, Fluid Extract, Cerate, Ointment, Plaster and Suppository.

8. Explain the following: Specific Gravity (of liquids), Trituration, Percolation, Distillation, Dialysis.

9. Explain the theory of the fermentation of Grain. Enumerate the various products used in Pharmacy in the order in which they are formed by this process, and give the Specific Gravity of the official liquids obtained by this kind of fermentation.

10. Give the official name, locality and natural order of the plant which furnishes Liquorice Root. What official product is made from the root, and how is it prepared? Name two official preparations into which this product enters.

11. State the official formula for the preparation of Magnesia. What change takes place during the process? What is its metallic base? Into what official solution does the carbonate enter? Give the formula and process for making this solution.

12. State how you would prepare this, and when prepared, would you dispense it?

R	Acid: Arsenios:	.	.	.	gr. xxxii
	Potassii Bicarb:	.	.	.	gr. xxxii
A	Spirit: Lavand: Comp:	.	.	.	f ʒss
	Aquæ Destillatæ,	.	.	.	f ʒviiss

Signa: A teaspoonful to be taken every two hours.

What reaction will take place in the following prescription? Would you dispense it?

For T. Brown's Wife.

R	Potassii Cyanid:	.	.	.	gr. iv
	Syrup: Simp:	.	.	.	
B	Syrup: Acidi Citrici,	.	.	.	āā f ʒii

Signa: A teaspoonful to be given night and morning.

How would you prepare and dispense this prescription?

R	Plumbi Acetat:	.	.	.	
C	Zinci Sulphat:	.	.	.	āā ʒii

Misce. Fiat chart: no: xii.

Add one powder to half pint of water and use as directed.

Alumni Association of the Massachusetts College of Pharmacy.—The regular meeting was held on the evening of Feb. 7, President Kelley in the chair.

Mr. Kelley called attention to an article called *Absorbent Cotton*, which had recently

made its appearance; he stated that both this and Dennison's jewelers' cotton were much superior to tow for straining solutions. The absorbed cotton sinks immediately on being thrown into water.

Mr. Kelley exhibited some samples of dialyzed and of recrystallized *salicylic acid*, the latter being the cheaper article, but the general opinion seemed to be that the former was handsomer.

Mr. Doliber exhibited a specimen of *Xanthium spinosum*, and the fluid extract of the same. This article had been introduced as a remedy for hydrophobia, but there are no cases of cure on record since its introduction. The drug possesses a strong odor and taste, and probably will prove useful for something.

Mr. Bartlett spoke of cosmolin, vaselin, dermolein, etc., and exhibited a preparation similar to these in nature and appearance. It is of the consistence of an ointment and can be made from Downer's heavy marine lubricating oils, which costs fifty cents per gallon, by mixing it with animal charcoal at 150°F., and then filtering in a jacketed funnel. (See, also, "Amer. Jour. Phar.," 1875, p. 257.) This led to conversation on animal charcoal. Mr. Doliber had seen some which contained considerable sulphur. Prof. Markoe thought it must have been previously used and partially restored.

Mr. Doliber spoke of an error which occurred in printing Dr. Brown-Sequard's prescription for epilepsy in the Boston "Medical and Surgical Journal," in an article written by Dr. Ayer. The second article in the prescription was "iodidi bromidi," and should have been potassii bromidi. The error was corrected in small type on the bottom of the last page of a subsequent number, but probably a great many had not seen it, as he had since received many orders for bromide of iodine.

The New York College of Pharmacy, we are pleased to learn, has purchased a building, hitherto used as a church, and conveniently and accessibly located. It is proposed to raise the roof and put in an additional floor, with the view of having two lecture rooms and a laboratory, besides other necessary rooms. The new building will probably be occupied about May 1st.

Pennsylvania Pharmaceutical Association.—In response to an invitation (p. 142) a number of leading druggists from different parts of the State assembled together in the rooms of the Pennsylvania State Agricultural Society, in Harrisburg, Feb. 26th, at 11 o'clock, for the purpose of organizing a State pharmaceutical association. There were present representatives from Philadelphia, Lancaster, Reading, Pottsville, Columbia, Chambersburg, Carlisle, Shippensburg and Harrisburg. The meeting was temporarily organized by the appointment of Charles A. Heinitsh, of Lancaster, President, and John M. Maisch, of Philadelphia, Secretary. The morning session was occupied in the adoption of a constitution and by-laws.

After a recess of an hour for dinner the association reassembled at half-past two o'clock. The committee appointed at the close of the morning session to nominate permanent officers for the ensuing year, reported as follows:

President, Charles A. Heinitsh. Vice-Presidents—Geo. W. Kennedy, Pottsville; Dr. W. H. Egle, Harrisburg. Secretary, J. A. Miller, Harrisburg. Assistant Sec-

retary, Jacob H. Stein, Reading. Treasurer, Joseph L. Lemberger, Lebanon. Executive Committee—Chas. H. Cressler, Chambersburg; W. F. Horn, Carlisle; J. A. Meyers, Columbia.

Various resolutions were adopted. The officers of the association were empowered to obtain a charter; a Committee on Pharmaceutical Legislation, consisting of Dr. W. H. Egle, Charles T. George and Dr. George Ross, was appointed, and the Secretary was authorized to send a circular to every druggist in the State explaining the objects of the organization and invite him to become a member. The association then adjourned to meet in Reading on the second Tuesday of June next. Those present at the meeting were very much gratified with the success of the movement, and expressed their belief that in a short time the association would embrace in its membership all the reputable pharmacists throughout the State.

Alumni Association of the Philadelphia College of Pharmacy.—The final meeting of the session was held February 7, 1878, President Mattison in the chair. In point of attendance it surpassed any previous one, over seventy persons being present. The minutes of the last meeting were read and approved. Mr. Kennedy gave the result of an assay of a sample of gun-powder which he had analyzed. He also gave the particulars of the case of poisoning by potassium chlorate, to which he alluded at a former meeting (see page 112). The President mentioned a case where the careless use of the troches of the substance had produced alarming symptoms.

Mr. Trimble read a paper prepared by Mr. Pennypacker, containing valuable information on the subject of the Salicylates (see page 114).

Mr. Betz reported an examination of the expressed oil of wild cherry pits, referred to him at an earlier meeting (see page 111).

Dr. Miller gave a resumé of some curious facts connected with Chinese and Mexican pharmacy, gathered from the respective exhibits of those countries at the Centennial. He also submitted a label for specimens, which, on being filled out, would state much information connected with the *Materia Medica* specimen on which it was employed. Samples of drugs, with the appropriate facts, were shown, and presented to the Alpha Phi Society. Highly aromatic oil of mace, obtained from mace by hydraulic expression, was brought to the notice of the meeting by the same gentleman.

The President showed a convenient and desirable little addition to the dispensing counter, in an apparatus for rapid filtration, which deserves to be generally adopted (see page 105). A paper on dialysis, explaining the meaning of the term, and process, was also read by Mr. Mattison (see page 102).

Mr. Sayre remarked on the use of dialyzed iron as an arsenical antidote, and the necessity of changing it into the form of a magma; also desired information on the subject of chrysophanic acid, which at present he is making from the East India goa-powder. Its use in certain skin diseases was adverted to.

The names of a number of specimens which had been submitted to the class for examination were then announced. They were very generally recognized by the students.

On motion the meeting adjourned.

WALLACE PROCTER, *Sec'y.*

EDITORIAL DEPARTMENT.

State Pharmaceutical Societies.—We are much pleased that our suggestion as to the advisability of calling a convention, with the view of organizing an association embracing all the reputable pharmacists and druggists of Pennsylvania, has been promptly acted upon, as will be noticed from the subjoined circular:

"Harrisburg, February 14, 1878. Dear Sir—You are hereby cordially invited to meet with us in this city on Tuesday, the 26th inst., at 11 A. M., in the rooms of the Pennsylvania Agricultural Society, for the purpose of organizing a State Pharmaceutical Association. Please extend the invitation to all druggists in good standing in your locality. Charles A. Heinitsch, Lancaster; Geo. W. Kennedy, Pottsville; Joseph L. Lemberger, Lebanon; J. A. Miller, Wm. H. Egle, M.D., C. K. Keller, Chas. T. George, G. H. Markley, A. W. Nunemacker, J. H. Boher, Harrisburg."

As will be seen from the report on another page, the Association has been organized and is the second one in the Middle States, that of New Jersey being the first. We are aware that in others conferences have been held looking towards the same end, and we sincerely wish that they may likewise lead to the same desirable result.

Hospital Stewards, U. S. A.—The importance of securing for the armies the services of educated pharmacists is generally recognized in Europe, and in no country, perhaps, has this necessity been brought to such a state of perfection as in France, where there is ample chance given for promotion for services rendered, and where, as a natural consequence, many highly-educated pharmacists are found in responsible positions, and with a military rank commensurate to their responsibility. The medical service of the United States Army offers similar inducements to graduates in medicine, who before they are admitted as assistant-surgeons, have to submit to a thorough examination. It is different with the pharmacists of the army, the *hospital stewards* as they are now officially termed, or the *medical stewards* as they are proposed to be called hereafter. It is true that, previous to their appointment from the ranks of civil or military life, they must be recommended as being "temperate, honest, and in every way reliable, as well as sufficiently intelligent and skilled in pharmacy for the proper discharge of the responsible duties likely to devolve upon them;" but we regard it as a radical error, that they should not, like the surgeons, be required to have been specially educated to their calling. We are well aware that there are many pharmacists enlisted as hospital stewards, and the sooner it is recognized that the *best* pharmaceutical skill is not too good for the army, the better will it be for this special branch of the service, and the more readily will the army secure the services of well-educated pharmacists. A system of enlistment and promotion, similar to that of the French army, would secure this.

The hospital stewards of the army are now endeavoring to secure for themselves a well-recognized rank, and in this they should be successful. The demands to be recognized as sergeants and sergeant-majors, with an occasional promotion to the rank of lieutenant, are moderate enough, and, in our opinion, by far below their responsibilities and the duties required of them.

Curious Synonym for Quinia.—Recently we were shown a prescription in which the first article ordered was,

R Sulphatis americanæ australis, gr. xxiv.

This *South American sulphate* was interpreted to mean quinia sulphate, the former term having been probably selected by the physician because, from a fancied idiosyncrasy or dreaded ill-effects, the patient imagined to be unable or refused to take quinia.

Prescription Blanks and the Percentage Business.—We have occasionally referred to the nefarious collusion between some physicians and apothecaries, by which the patient is made to pay extortionate prices so that the attending physician may, besides his regular fee, secure some additional cash through the apothecary. On various occasions we have alluded to these corrupt bargains, and we are prompted to again refer to them by having seen a prescription blank, upon the back of which is printed the following notice:

“N. B.—In justice to myself and the profession, attention is called to the fact that the physician who writes upon this blank does not accept percentage from the apothecary.”

We are not aware to what extent the practice prevails, or is by the public supposed to prevail in the community where the blank before us originated; but for the honor of both professions we trust that the honorable physicians and pharmacists, who would spurn such collusion, are vastly in the majority, and do not form the exception.

The Prolificness of Stramonium.—Some time ago, Mr. Theodore G. Davis informed us that last year he had chosen a plant of *Datura stramonium* with the intention of collecting its leaves and seeds. The plant, however, was destroyed by a storm in September, at which time it had attained a height of four and a half feet, and with its branches spread over an area five feet in diameter. It had produced 125 flowers and capsules; each capsule contained between 700 and 735 seeds, and as it takes between 9 and 10 seeds to weigh one grain, the plant would have produced nearly 20 troyounces of seeds, if all had ripened.

The Necessity of Forest Culture.—We find it stated that in ten years there have been destroyed in the United States not less than 12,000,000 acres of forest trees. We do not know how accurate this estimate may be, but it must be evident to all observing travelers that in many localities forests are ruthlessly destroyed for the sake of the timber, and without making any endeavor of replanting them. The important influence of forests upon the climate is well known and generally admitted, and with such a wholesale clearing of timber land as above indicated, must soon impress upon all the necessity of rational forest culture, which, up to this time, has been almost completely neglected.

OBITUARY.

PAUL ANTOINE CAP died November 12, 1877, at the advanced age of 90 years. He was a prominent pharmacien at Paris and the author of an elementary work on pharmacy and of numerous essays on pharmaceutical subjects, a number of which were transferred to the earlier volumes of the "American Journal of Pharmacy" up to the year 1865. The deceased was a corresponding member of the Philadelphia College of Pharmacy.

NAPOLÉON NICKLÈS, pharmacist at Benfeld, Alsace-Lorraine, died there January 6, aged 69 years. The deceased was born Oct. 23, 1808, became an apprentice in January, 1822, and subsequently served as clerk at Strasburg and other towns of Alsace-Lorraine. He graduated at Strasburg in 1833, and in the following year established himself at Benfeld, where he continued to cultivate his favorite study of botany. His scientific attainments were recognized by many French and German societies, in electing him honorary or corresponding member. He was the author of several works on botanical and agricultural subjects, and a contributor to the "Journal de Pharmacie d'Alsace-Lorraine."

HENRY DANIEL RUHKORFF, the famous magneto-electrician, died at Paris Dec. 20, 1877, in the seventy-fifth year of his age. He was born at Hannover, Germany, but, while a youth, came to Paris, where, in 1844, he attracted attention by a new thermo-electric battery, and in 1851 constructed the apparatus known everywhere as Ruhmkorff's apparatus. In 1855 he was awarded the first prize of 50,000 francs for the excellence of his electric apparatus.

ANTOINE CÉSAR BECQUEREL was born March 8, 1788, at Chatillon sur Loing, Department of Loire, and received his scientific education at the Paris Polytechnic School. After having served in the army until 1815, he devoted himself to his favorite branch of science, physics, and more especially to magnetism and electricity in their application to the arts and sciences. One of the fruits of these investigations was his well known work, *Electrochimie appliquée aux arts*, which appeared in 1842. A number of his essays have appeared in the earlier volumes of this journal. He labored for a long time as professor of physics at the Jardin des Plantes, and was a member of the Academy of Sciences since 1824, and of many learned societies. He died January 18, having nearly completed his ninetieth year.

VICTOR HENRI REGNAULT, another eminent scientist of France, died at Paris, January 19, at the age of 67½ years. He was born at Aix-la-Chapelle in 1810, finished his scientific education at the Paris Polytechnic College, occupied afterwards the chair of physics and chemistry at Lyons, and was then called to Paris, first to the Polytechnic School, and in 1841 to the Collège de France. Since 1854 he was director of the porcelain manufactory at Sèvres. The most important researches of the deceased were on the expansion, compression and density of gases and liquids, on the latent heat of vapors, on the specific heat of bodies, etc. A few of his papers, having some bearing on pharmacy, will be found, in abstract, in former volumes of this journal.

THE AMERICAN JOURNAL OF PHARMACY.

APRIL, 1878.

PAINTS, COLORS AND THEIR ANALYSIS.

BY HENRY G. DEBRUNNER, Chemist.

As it is quite customary in many parts of the United States that druggists are at the same time dealers in paints, colors, window glass, putty, etc., a closer examination of these articles, as to their composition, character and most frequent adulterations, will probably be of some interest to the readers of this journal.

White Paints.—In speaking of *white lead*, the following classification will be most suitable:

1. Pure white lead, a mixture of plumbic carbonate and oxyhydrate.
2. White paints, bearing the above name and containing a certain percentage of real white lead, which very often decreases to mere traces.
3. White paints, not unfrequently marked "pure white lead," but without the name of the manufacturing firm, and containing no lead whatever.

The following analysis of a sample of white lead, prepared by the Dutch method and exhibited at the Centennial Exposition in Philadelphia, may be taken as a representative of the first-class, the approximate formula derived from the analysis being $Pb_{50}C_{29}H_{36}O_{151}$.

Plumbic oxide,	. . . . .	83.9668 per cent.
Carbonic acid,	. . . . .	9.6000
Water combined,	. . . . .	5.8332
Moisture,	. . . . .	0.6000

There are chiefly two methods in use for the manufacture of white lead, viz. : the Dutch and the French process. The former consists in a slow corrosion of plates or buckles of metallic lead in pots containing a small quantity of dilute acetic acid; the basic acetate thus formed is changed into the corresponding carbonate by the action of the carbonic acid of the atmosphere, which requires several weeks' time. The French process consists in forming a basic acetate by saturating acetic

acid with plumbic oxide, and precipitating the latter by carbonic acid, prepared from lime-stone or marble dust and muriatic acid. The product of the Dutch process is a mixture of plumbic oxyhydrate and carbonate in varying proportions, that of the French process an almost pure carbonate. The gloss and brilliancy of the pigment is chiefly due to the plumbic carbonate, while the oxyhydrate increases its body. Representatives of the second class are very frequently met with in the trade, containing from 10 to 50 per cent. of "pure white lead," the remainder being substituted by oxide of zinc, plumbic sulphate, chalk, whitening, gypsum, barytes (BaSO_4), clay, etc.

The following "white lead" may fairly represent the third class:

Calcic carbonate,	14.800 per cent.
Zinc oxide,	60.500
Baric sulphate,	19.400
Silicic acid,	1.350
Iron and alumina,	2.300
Lime (in insoluble residue),	0.560
Sulphuric acid (in HCl sol.),	1.710
Plumbic oxide (as PbSO_4),	Slight trace.

100.620

Insoluble residue in hydrochloric acid, 21.50 to 21.57 per cent.

It is evident that this latter "white lead" was prepared by mixing and grinding together whitening 15, barytes 25 and zinc white 60 parts. Silicic acid, iron, alumina and the insoluble portion of lime are frequent impurities in barytes. Plumbic oxide is very often found in commercial *zincs*, in quantities varying from one-half to 10 per cent., as we will see later. As the term "white lead" has become almost synonymous with "white paint," it will suffice to state that numerous combinations and mixtures of all the white pigments mentioned, are sold partly as liquid, or ready mixed paints, or brought in the market as dry colors in form of powder or ground in oil. In the following I add a few analyses of "zincs," as they are found in our present market:

1. *Sample.*

Very fine white, best quality.			
Moisture,	0.4 per cent.	Zinc oxide,	99.1720 per cent.
Sulphuric acid,	0.0122	Sulphate zinc,	0.0243
Zinc oxide,	99.4	Sulphite zinc,	0.3870
Sulphurous acid,	0.1711	Moisture,	0.4000
<hr/>		<hr/>	
99.5833		99.9833	

Contained traces of iron.

2. Sample.

Zinc oxide (uncombined),	98.298 per cent.
Zinc oxide (combined),	0.270
Sulphuric acid,	0.375
Sulphurous acid,	0.122
Lime (as sulphate),	0.123
Trace of iron,	
	<hr/>
	99.188

3. Sample.

Moisture,	0.636 per cent.
Sulphurous acid,	0.627
Sulphuric acid,	4.656
Plumbic oxide,	5.453
Zinc oxide,	88.254
Lime and iron, trace.	
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	99.676

5.453 per cent. PbO is equal to 7.41 per cent. PbSO_4 , and of the sulphurous acid 0.1125 per cent. was combined, and 0.5145 per cent. mechanically absorbed.

Lime, gypsum, plumbic sulphate and sulphurous acid are accidental impurities due to the process of manufacture and depending also on the quality of the ore from which the zinc-white is directly prepared. In some of the samples—particularly in moist ones—the larger portion of the sulphurous acid is merely mechanically absorbed or enclosed, and can be expelled with the moisture by heating on the water bath. In the course of time, however, zinc sulphite, ZnSO_3 , is formed, which, finally, is converted into zinc sulphate ZnSO_4 . If such “zincs” containing sulphuric acid are used for the adulteration of white lead, plumbic sulphate is formed, which may considerably alter the quality of the paint. A patent white paint, said to be manufactured by precipitating zinc sulphate with baric sulphite, analyzed as follows :

Baric sulphate,	60.83 per cent.
Zinc sulphite,	32.28
Zinc oxide,	6.88
	<hr/>
	99.99

That “pure zincs,” like “white lead,” are sometimes adulterated, may be illustrated by the following analysis :

Baric sulphate,	54.200 per cent.
Zinc oxide,	44.300
Sulphuric acid,	0.788
Lead, lime and alumina,	traces.
	<hr/>
	99.288

It is evident that the practical working formula for making this zinc-white was : barytes, 55 and zinc (ZnO), 45 parts. Besides the brands mentioned there are numerous white paints perfectly free from lead and zinc, consisting of mixtures of China clay, barytes, whitening, etc.

Blue Colors and Paints.—The most prominent pigments of this

class, which are extensively used in the arts and manufactures, are ultramarine and Prussian blue. The former is a combination of sodic sulphide with alumina silicate. Lapis lazuli, the native ultramarine, is a very beautiful, though rare mineral, and resists the action of acetic acid and alum, while the artificial product is more or less acted on by these chemicals, and entirely destroyed by strong mineral acids, with evolution of sulph-hydric gas. There are several shades of ultramarine in the market, viz. :

- a. Green or bluish-green ultramarines.
- b. Light blue shades of great intensity.
- c. Pure deep blue shades.
- d. Reddish or violet ultramarines.

They all have qualitatively the same composition, merely differing in the percentage of sulphur and oxygen, and are most generally manufactured by ignition of a mixture of China clay, sodic sulphate and charcoal. The product is green, and is sometimes brought into the market after grinding, washing and drying. On mixing this green powder with sulphur, and heating till the latter burns out, forming sulphurous anhydrid, a light-blue shade is obtained, containing from 6 to 8 per cent. of sulphur.

Beautiful deep blue shades are formed by addition of sodic carbonate and sulphur to the charge previously mentioned, and subsequent reheating with sulphur. The product of this process contains from 10 to 12 per cent. of sulphur. Mixtures of China clay, infusorial earth, coal, sodic carbonate and sulphur yield reddish-blue and violet shades on ignition.

The more silica an ultramarine contains the better it resists the acids. These pigments are extensively used in fresco painting.

As to Prussian blue—ferrocyanide of iron—I refer to my article on "Wash-Blue and its Analysis," in the "*American Journal of Pharmacy*," Feb., 1877. The lighter shades of blue are obtained by grinding white pigments, as chalk, whitening, barytes, zinc, clay, etc., with a certain quantity of pure Prussian or Chinese blue. It is astonishing what an immense colorific power this pigment possesses, particularly if very finely distributed.

The following experiment, which may be worth while trying, proves the latter assertion. Take 9.6 grams of whitening and 0.4 of pure blue. After mixing them in a mortar and rubbing with a pestle for

awhile, take a sample of the mixture, while the remainder is treated in the above-mentioned manner for about half an hour longer. The mixture now exhibits a far deeper shade than the sample previously taken, with which it corresponds in composition, so that the uninitiated will hardly believe that both are formed from the same constituents, in the same proportion. 1 per cent., even $\frac{1}{2}$ per cent., of blue with 99 to 99 $\frac{1}{2}$ per cent. of whitening or "zinc" (ZnO) will yet form a fine sky, or celestial, blue, as some manufacturers prefer to call it. Everybody has seen those blue painted barrels in which coal oil is shipped. An analysis of said paint gave the following result:

Calcic carbonate,	59'032 per cent.
Sulphuric acid,	0'583
Ferric oxide (from blue),	2'200
Volatile portion of the blue,	2'200
Zinc oxide,	36'120
Lead,	trace
	<hr/>
	100'135

The white paint of the lid of these barrels analyzes as follows:

Sulphuric acid,	12'546 per cent.
Lime (as sulphate),	9'068
Zinc oxide,	78'500
Traces of alumina.	
	<hr/>
	100'114

This paint had been ground in oil, which was eliminated by ignition; the calcic sulphate, CaSO_4 , therefore, is to be calculated as gypsum, $\text{CaSO}_4 + 2\text{H}_2\text{O}$, which approximately leads to the following working formula: Gypsum ($\text{CaSO}_4 + 2\text{H}_2\text{O}$) = 25, and zinc white (ZnO) = 75 per cent.

The following analyses of "coal oil" blues of different make show that they all contain about 4 per cent. of the blue pigment, and solely differ in quality and quantity of the white admixtures:

Ferric oxide (from blue),	2'023 per cent.
Volatile portion of blue,	2'023
Carbonic acid,	25'232
Silicic acid,	0'269
Sulphuric acid,	1'048
Lime,	35'215
Magnesia,	0'600
Plumbic oxide,	1'987
Oxide zinc,	31'538
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	99'935

These results, like the preceding analysis of coal oil blue, lead to the following working formula I, while a sample made by a Pittsburg firm showed the composition II.

	I.	II.
Whitening,	60 per cent.	46 per cent.
Zinc white,	36	50
Prussian blue,	4	4

Yellow Paints.—Plumbic chromate is the most prominent coloring constituent of these paints. Light shades, as “canary,” “lemon,” etc., are obtained either by admixture of white substances on grinding, as previously mentioned, or, for finer brands, by precipitating the lead solution (nitrate, in some cases acetate) by mixtures of potassic bichromate and alum solutions, thus producing mixed precipitates of very finely divided plumbic sulphate and chromate, which afterwards can be further “thinned down” on grinding. The more dilute the solutions the more tender and finer is the shade of the product. Acetic solutions give a deeper yellow precipitate than those of plumbic nitrate. Temperature, dilution and the mode of precipitation also exert great influence on the quality of the product, more marked in this, although generally observed in the manufacture of all colors. A sample of commercial chrome-yellow analyzed as follows:

Moisture,	0.150 per cent.
Baric sulphate,	47.050
Plumbic sulphate,	7.205
Plumbic chromate,	45.849
Gypsum,	traces
	<hr/>
	100.254

Orange shades are obtained by boiling the yellow precipitate with caustic soda, whereby a basic chromate is formed. Other inorganic yellow pigments, as baric chromate, cadmium sulphide, arsenic sulphide, etc., have but very limited application, the latter on account of its poisonous qualities.

Red Paints.—Vermillion, or mercuric sulphide, and chrome-red, or so-called American vermillion, a very basic plumbic chromate, are extensively used in painting, the latter for agricultural implements, the carriages of fire-engines, etc.

Vermillion is prepared by shaking mercury in iron flasks with solutions of alkali-polysulphurets, or caustic soda, and flowers of sulphur. The shaking is done by machinery, and lasts for several hours, when

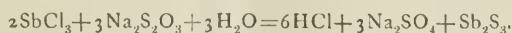
the previously black sulphide will assume a beautiful red color. The quicker the motion the lighter and more fiery will be the shade. Its high price prevents an extensive use of this pigment in painting.

American vermilion is formed on boiling white lead with a solution of potassic bichromate. The genuine article is of a beautiful red color, which resists very well to atmospheric influences. In order to hide the decrease of intensity of this color, resulting from excessive admixture of white bodies, it is now often brought to the necessary shade by the addition of anilin dyes or corallin. The following analysis of a scarlet shows the composition of this class of paints :

Moisture,	.	.	.	.	.	0.250 per cent.
Organic pigment,	.	.	.	.	.	2.400
Baric sulphate,	.	.	.	.	.	46.500
Basic lead chromate,	.	.	.	.	.	20.093
Plumbic sulphate,	.	.	.	.	.	31.700
						<hr/>
						100.943

The organic pigment was extracted with alcohol, and the beautifully colored solution left, on evaporation in a watch glass, a crystalline crust having a green metallic lustre. Further tests proved it to be corallin, soluble in alcohol and alkalies, insoluble in water. The immense colorific power of anilin dyes renders it possible to give red lead, Pb_3O_4 , 'orange mineral', $(Pb_3O_4)_x + (PbO)_y$ and even massicot, PbO , a beautiful scarlet shade. These "dyed paints" fade very rapidly when exposed to light and air, but keep well when sold in hermetically sealed tin cans, either dry or in oil.

A beautiful red pigment, consisting of antimony sulphide, Sb_2S_3 , can be obtained by boiling antimony chloride with sodic hyposulphite, when an elegant reaction will take place, resulting finally as follows :



E. Kopp, who first showed that the red precipitate was neither oxychloride nor oxysulphide, also communicated a practical method for its manufacture on a large scale. The by-products, sodic sulphate and hydrochloric acid, could easily be recovered, and the latter utilized again to convert the black native antimony-sulphide into the desired

¹ Orange mineral is the product of calcination of white lead, at a moderate temperature, with free admission of air. It is made from the sweepings of white lead works.

chloride necessary for this manufacture. The fact, however, that this color is readily influenced by the atmosphere, etc., has so far prevented a more extensive application.

Green Colors and Paints.—These are either green colored chemical combinations like Paris-green, Scheele's green and chromic oxide, or secondly, mixtures of blue and yellow pigments like the so-called chrome-greens, which consist of lead chromate and Berlin-blue.

Paris-green, aceto-arsenite of copper, $=C_4H_6O_4Cu+3(As_2O_4Cu)$ is one of the most beautiful pigments, which, however, on account of its extreme poisonous qualities, is very limitedly used in painting. It is the more astonishing, therefore, to find this very pigment often used for staining wall-paper and fancy paper for confectioners' use (see my article "Dangerous Candy," vol. 49, 1877, p. 14, of this journal). Muspratt gives the following analysis of this pigment :

Arsenious acid, As_2O_3 ,	.	.	.	58.65 per cent.
Cupric oxide, CuO ,	.	.	.	31.29
Acetic acid, $C_2H_4O_2$,	.	.	.	10.06

Immense quantities of Paris-green are used to kill potato-bugs. It is often adulterated with gypsum, which will be left as insoluble residue on addition of ammonia, in which the pure pigment dissolves entirely.

Scheele's Green is cupric arsenite, and also highly poisonous. It is darker and of a less bright and elegant shade than the former.

Guignet Green, chiefly consisting of chromic oxyhydrate or oxyborate, is perfectly harmless, and forms on fusing potassic bichromate with boric acid, the mass being subsequently extracted with hot water, when the pigment will be left as a beautiful green powder, which is of more importance in calico printing than in the manufacture of paints.

The most prominent representatives of the second class are the numerous shades of varying mixtures of Prussian blue and lead chromate, which, in regard to their manufacture as well as to their analysis, are the most complicated colors in the market. Almost every color-work and, doubtless, every color-maker, pretends to have some secrets about the "greens." Very often these colors contain tartaric, oxalic or citric acid, not unfrequently all three in minute quantities, which the color-maker adds when the green precipitate has already formed, "to improve the shade." (!) It would require too much space to dwell on the manufacture of chrome greens, and it therefore may suffice to

state that these mixtures are obtained by precipitation, so that the yellow and blue pigments meet in statu nascendi. For instance, into a large vessel containing a solution of blue in oxalic acid, lead nitrate or acetate is run in at one and potassic bichromate at the other extremity, while the contents of the vessel are constantly agitated. The lime contained in the large quantities of water used as solvents suffices to deprive the blue of its relatively small quantity of solvent, forming calcic oxalate.¹ In this case the use of oxalic acid is fully justified. Far more frequently, however, the blue is applied as a thin pulp, not dissolved in oxalic acid, which process, besides being cheaper, answers equally well. Clay, gypsum and barytes, or whatever white admixture is desired, are added to the green pulp with constant stirring, and more thoroughly incorporated by subsequent repeated grinding. Various other methods, though chiefly based on the above principles, are in use at the different works to produce different qualities and shades of chrome-greens. The following analyses may illustrate the composition of this class of paints:

Shade—Light-green, similar to Paris-green, but less fiery :

	Moisture,	.	.	.	0'4500 per cent.
	Loss on ignition,	.	.	.	3 1750
a.	{ Baric sulphate,	.	.	.	61'2200
	{ Gypsum,	.	.	.	0'1290
	Plumbic sulphate,	.	.	.	5'0000
	Zinc oxide,	.	.	.	0 5750
	Alumina,	.	.	.	4 0500
b.	{ Magnesia,	.	.	.	0'2736
	{ Lime,	.	.	.	0'5000
	Silicic acid,	.	.	.	11'2400
c.	{ Plumbic oxide,	.	.	.	7'4700
	{ Chromic acid,	.	.	.	3 3400
d.	Ferric oxide,	.	.	.	2 8000

100'2226

a = barytes ; *b* = China-clay ; *c* = chrome-yellow ; *d* = non-volatile portion, namely, ferric oxide of the blue, which is equal to half the quantity of pure "commercial" blue present (see "Wash blue and its Analysis," vol. 49, 1877, p. 67, of this journal). The practical working formula, derived from this analysis, is as follows : Prussian-blue, 5'5 ; chrome-yellow, 11'0 ; barytes, 62'0 ; China-clay, 16'0, and plumbic sulphate, 5'5 parts—total, 100. This green also contained small quantities of tartaric and oxalic acids.

¹An oxalic solution of Prussian-blue easily throws down the pigment when other precipitates are produced in it, as in this case, even without presence of lime or other similarly acting agent.

Another sample analyzed as follows :

	Moisture,	.	.	.	.	.	0 100 per cent.
a.	{	Loss on ignition,	.	.	.	.	2 100
	{	Ferric oxide,	.	.	.	.	3'100
		Calcic carbonate,	.	.	.	.	9'934
		Baric sulphate,	.	.	.	.	72'900
		Sulphuric acid (soluble in HCl),	.	.	.	.	0'802
b.	{	Plumbic oxide,	.	.	.	.	8'437
	{	Chromic acid,	.	.	.	.	3'014
							<hr/>
							100'387

Direct estimation of carbonic acid = 4.2 per cent. *a* Prussian-blue ; *b* chrome-yellow. The practical working formula for this color would be: Chrome-yellow 10, blue 5, barytes 75 and whitening 10 parts—total, 100.

This green contained, besides the constituents mentioned, also oxalic, tartaric and citric acids in minute quantities.

Brown and Black Pigments.—Quite a number of iron ores, particularly the manganiferous oxyhydrates, either raw or in the calcined state, are frequently used as paints and termed umber and burnt umber.

A number of argillaceous iron ores have found similar application and yield brown paints of great durability. Light-brown shades of leather color are produced by boiling a neutral solution of ferrous sulphate with potassic bichromate. For darker shades a small quantity of caustic soda is added, together with the bichromate. Although these precipitates are of a leather color, their application is but very limited. Cupric ferro-cyanide, doubtless one of the most handsome brown-red mineral pigments, also belongs to this class. It is rather expensive, which circumstance seems to have prevented a more general application.

The coloring principle of most of the *black* mineral pigments is carbon, as, for instance, lampblack, boneblack and graphite or plumbago. The following is an analysis of a plumbago lately found in this State, of which I happened to obtain a sample. It consists of fine leafy particles, and is of sufficient purity to find useful application in either manufacture of crucibles and paints :

Moisture,	.	.	.	.	.	.	0 26 per cent.
Ash,	.	.	.	.	.	.	8'55
Carbon,	.	.	.	.	.	.	91'19
							<hr/>
							100'00

Some of these black pigments possess great colorific intensity and

will stand an admixture of 50 to 75 per cent. of white pulverulent substances, as, for instance, barytes, whitening, etc., without assuming a grey appearance. The different *grey* shades are obtained by mixing and grinding black pigments with large quantities of white substances as the above mentioned. Zinc dust—a by-product of the zinc distillation, the well-known reducing agent in chemistry—is also used as a grey paint. A sample of this substance, which, spontaneously ignited through the action of moisture, had the following composition (*vide* Berg und Hüttenmännische Zeitung, 1877):

Zinc,	40 0 per cent.
Lead,	2 5
Cadmium,	4 0
Zinc oxide,	50 0
Zinc carbonate and dust,	3 5
	<hr/>
	100 0

Several samples analyzed by me contained *in toto* 63.637, 79.978, 54.727 per cent. of zinc.

It would require too much space to treat of all the numerous pigments of less commercial importance; therefore, only those have been considered which are most frequently met with in the market. Concerning the different chemicals used in the manufacture of paints it may be stated that large colorworks very often prepare their own supplies, as, for instance, acetic acid, potassic ferrocyanide, alum, copper sulphate, the different lead salts, etc. As in many instances the solutions of freshly formed compounds can at once be applied without previous evaporation and crystalization, many colors can thus be far cheaper prepared than by those concerns who buy their supplies and produce the solutions from the crystallized chemicals. A similar saving is also caused by the use of “pulp” in producing color mixtures.

Analysis of Paints.—The sample to be analyzed may be in the dry state, ground in oil or in liquid form, ready for use. In the latter cases the fatty or resinous portions of the paint are extracted with benzin, alcohol and ether, which leave the pigment in form of a powder suitable for analysis. In some cases the additions may be removed by simple ignition; however, as reductions are very apt to take place, this process recommends itself only in a limited number of cases. If a complete analysis of a liquid paint is required, whereby, not only the pigment but also the vehicle, the different oils, the quan-

tity of resinous matter, benzin and turpentine are required to be known, the *modus operandi* becomes very complicated, and a strictly correct solution of this task is in some cases impossible.

We will first consider the analysis of the dry colors, or those freed from oil by extraction, and finally dwell on the ways and means by which we may get some information on the nature of the vehicle of a paint and the quantitative relations of its constituents.

The main difficulty in these analyses consists in the separation of the different lead salts which may be present, as, for instance, plumbic sulphate and chromate from each other, and from baric sulphate and silicates (clay). We have, however, in sodic hyposulphite an excellent solvent for plumbic sulphate, by means of which we may separate it from the above compounds. The analysis of a chrome green, containing a blue and a yellow color, is among the most complicated ones; the analytical method most suitable in these cases may be illustrated by the recapitulation of an actual analysis.¹ Let us suppose the qualitative analysis indicated the following constituents: Plumbic chromate, ferric ferrocyanide, plumbic sulphate, calcic sulphate, zinc oxide, silicates of lime alumina and magnesia (clay), baric sulphate and moisture. The estimation of these constituents is best done in the following manner:

1 or 2 grams are used for the determination of moisture; and the dry powder is then ignited in a porcelain crucible at a low heat just sufficient to destroy the ferric ferrocyanide, and reweighed to find the loss on ignition.

The calcined residue is extracted with sodic hyposulphite to dissolve the plumbic sulphate, which is subsequently precipitated with sulphuric acid, reconverted into plumbic sulphate, and finally weighed. Sodic hyposulphite may be advantageously used in the color analysis as a test for plumbic sulphate. Plumbic carbonate is perfectly insoluble in the hyposulphite solution, while traces of gypsum and minute quantities of lead chromate—particularly of the orange and red basic chromates will dissolve—a fact which must be borne in mind when performing a quantitative analysis of a paint. The errors thus caused are, however, very slight, and of no significance for practical purposes. It is advisable, and may serve as confirmation for the correctness of a result, to

¹ For other paints, like Paris green, white lead, zincs, etc., the usual analytical rules will give satisfactory results.

weigh the insoluble residue left after extraction with hyposulphite as well as the plumbic sulphate actually dissolved and reprecipitated. The difference must be very small.

The undissolved portion is washed, and finally treated with concentrated hydrochloric acid and absolute alcohol. The result is a green solution containing the chlorides of iron, aluminum, calcium, magnesium, chromium (from chromic acid acted on by alcohol) and zinc, and a white insoluble residue consisting of lead chloride, baric sulphate and the silicates of clay. This insoluble residue is collected on a tared filter, washed with strong alcohol, dried and weighed.

The filter is re-introduced into the funnel, the residue exhausted with boiling water in which plumbic chloride will dissolve, again dried and re-weighed. The aqueous filtrate is precipitated with sulphuric acid, and from the weight of the plumbic sulphate is calculated that portion of oxide of lead which has been combined with chromic acid. Determination by loss on washing and direct estimation agree well if the manipulations have been properly conducted.

The last insoluble residue, after washing with hot water, consists of baric sulphate and clay. The quantitative analyses of it and of the alcoholic muriatic acid solution previously obtained, are performed according to the usual methods, and need no further comment.

To detect organic acids in chrome-green the following process will give satisfactory results: About 10 grams of the green powder are macerated in dilute sulphuric acid, and filtered. The clear liquid is rendered alkaline by sodium carbonate, whereby iron and chromium are partly precipitated. After acidulation with muriatic acid the sulphate is removed by the careful addition of baric chloride, after which an excess of calcic chloride and sodium acetate is added. Calcium oxalate, being insoluble in free acetic acid, is precipitated, while the tartrate and citrate remain in solution. Neutralization of the free acid precipitates the former, and, on boiling, also the latter salt.

To ascertain the relative "strength" of two colors of similar shade, the following experiment is made: Half to 1 gram of each sample is mixed with 5 to 10 times its weight of a white pulverulent substance, which exerts no chemical action on the pigment, as, for instance, baric sulphate. After sufficient mixing, the shades are compared and the darker one made equal to the light one by further addition of baric sulphate. On re-weighing the samples their weights will give the ratio of their relative "strength."

To test whether red anilin or corallin (rosolic acid) is contained in a scarlet color, it is best to extract with water. If the resulting filtrate is colored red or pink, rose-anilin is very probably present. Corallin, the more frequently used pigment for this purpose, is insoluble in water, but dissolves easily in alcohol and alkaloids. Rose-anilin and corallin (a derivate of phenol) are very easily distinguished from each other by addition of ammoniac sulphide, which converts rose-anilin into colorless leukanilin, while it does not change the beautiful scarlet shade of corallin.

Sometimes a chemist is asked to determine the relation between the dry pigment and the vehicle of paints, either liquid or ground in oil. In this case a weighed quantity of the pasty or pulpy mass to be analyzed is freed from the fatty and resinous bodies by extraction with ether. The weight of the dried pulverulent residue collected on a tared filter, gives the necessary data for the information desired. In cases where the nature of the pigments will not be changed on ignition, oil and resinous matter may be destroyed by combustion, and the quantity of the dry pigment determined on re-weighing the crucible. A white paint in oil thus left 31.412 per cent. dry powder, consisting of baric sulphate, clay and calcic carbonate.

Far more difficult than these investigations is the analysis of those so-called liquid or ready-mixed paints, in case that vehicle as well as the suspended coloring matter are objects of analysis. The vehicle for paint is combined with the aim of obtaining approximately the same specific gravity as that of the pigments, so as to keep the latter suspended (most of them "settle," however, nevertheless). Among the most commonly-occurring constituents of the vehicle may be mentioned benzin, oil of turpentine, resins, linseed-oil, etc.; soap, water, glue, small quantities of soda, borax or alum, besides all kinds of low-grade oils, are frequently met with. The nature of a vehicle may be approximately determined by fractional distillation; exact and reliable analytical methods are so far not known.

In the following I add such an analysis of a liquid (white) paint :

Solid incombustible white pigment obtained on extraction with benzin, ether and subsequent ignition,	34.405 per cent
Linseed-oil and resinous matter,	49.095
Oil of turpentine,	16.500
	<hr/>
	100.000

No water nor benzin. (Test for water—anhydrous cupric sulphate.)

The fact that this paint began to boil at 250°F., when also distillation began, excludes the probability of the presence of the volatile petroleum-benzin. A separation of oil of turpentine from the above-named hydrocarbon by fractional distillation is impossible. The oil and resinous constituents began to decompose at 350° to 400°F. on formation of acrolein.

The white pigments, of which said paint contained 34.405 per cent., analyzed as follows :

Oxide of zinc,	66.400 per cent.
Lime,	1.758
Sulphuric acid,	1.920
Clay,	14 per cent. sol. 30.300
	<hr/>
	100.378

besides traces of lead and iron.

Probable working formula, 70 "zinc" + 30 alum-clay.

The tests for magnesia, borax, water and carbonic acid gave negative results. It is evident that in liquid paints a "cheap" vehicle will permit their sale at a low price or help to increase the profits already produced by a strongly adulterated colorific base; it is also in these very paints—not without some exceptions, however—where the "humbug" reaches its highest point of culmination.

Lake Colors.—I may be allowed to insert here a few remarks on lake colors. The numerous pigments of vegetable and animal origin show, to a certain extent, a great deal of similarity among each other, as most of them form insoluble colored compounds with alumina, which are generally termed lakes, and whereby the coloring principles of dye-woods are transferred into insoluble colored compounds, which find frequent application in paper-staining, calico-printing and various other industries. Stannous chloride also forms lakes with a large number of pigments; it is, however, more expensive than the alum solutions required in the former process. One of the most beautiful lakes is undoubtedly *carmine*, an insoluble compound of the pigment contained in cochineal. There are quite a number of brands in the market, of which Carmine No. 40 is the finest. While the lower grades contain alumina, this latter one is free from it, and perfectly soluble in ammonia. From its mode of manufacture, which may be fairly termed a public secret, as well as from the fact that it leaves but very little non-aluminous ash, it may be considered an insoluble combination of

carminic acid, $C_{17}H_{15}O_{10}$, with animal matter, it being precipitated by isinglass from an acid aqueous decoction of cochineal, containing potassic bitartrate, alum and an excess of citric acid. The mother-liquor of this first precipitate, which is termed "black liquor" by the practical men, very probably on account of its beautiful "red" color, will yield a second precipitate of carmine-red, $C_{11}H_{12}O_7$, on standing for some time. The red pigments of the "black liquor" are almost perfectly precipitated by alumina *in statu nascendi*. Stannous chloride and mercury nitrate also produce scarlet precipitates, which, however, are of mere scientific interest.

Anilin and *phenol* colors in many instances show a similar affinity to alumina and stannous oxide; the only drawback to a general application of these beautiful pigments in form of lakes is their rapid fading. Quite fiery shades can also be prepared by merely immersing starch, flour or whitening in a solution of these pigments. In the French department of the Philadelphia Exposition a number of such lakes were exhibited, the base of which was said to be starch. The quality of these colors can be considerably improved by the addition of certain animal substances, as, for instance, albumen, casein, isinglass or white glue, for which these artificial pigments show a great affinity, thus effecting a more intimate union between base and pigment. This process possesses some similarity with the "animalization of cotton," in dyeing, which consists in impregnating the vegetable cotton fibre with animal matter, in order to facilitate the fixation of the dye. For corallin lakes I can recommend the following process from my own experience:

Two liters of corallin solution, containing 250 grams of corallin, rendered soluble by one pound of sal soda, are equivalently precipitated by one liter of calcic chloride, containing 200 grams $CaCl_2$. Corallin, the product of the action of nascent carbonic oxide on phenol, being soluble in alkaline carbonates, becomes deprived of its solvent on addition of calcic chloride, and will precipitate together with calcic carbonate in a state of very fine division. This precipitate may be mixed with starch or flour to produce lighter shades of scarlet. If a solution of isinglass has been added, on precipitation a small quantity of alum is added. The lake thus obtained, which is of a beautiful scarlet shade, is dried at about $150^{\circ}F$. It fades less readily than if prepared without addition of isinglass, which seems to prevent, at least to some extent, the formation of the light rose-colored calcic rosolate.

Black Diamond Steel Works, March 12, 1878.

OIL OF SWEET ALMONDS.

BY C. E. DUPUY, PH.G.

Having noticed, while preparing unguentum aquæ rosæ; an almond-like odor, and, thinking it came from the supposed oil of sweet almonds which I was using, it led me to an examination of the article.

I observed that the oil possessed an odor resembling that of oil of bitter almonds, and, that by heating a short time, this odor disappeared and in its stead the oil had acquired a slightly rancid odor. It also soon produced quite a heavy precipitate of a white flocculent character. The oil congealed at a temperature of 15°F. , and had the sp. gr. 0.945. It was insoluble in ether, soluble in two volumes of oil of turpentine and in an equal portion of chloroform, insoluble in cold alcohol of the sp. gr. 0.827, but soluble in 30 volumes of boiling alcohol of the same sp. gr.

Treated with cold HNO_3 the oil assumed a violet tinge, which soon developed into a bright yellow color. But even after long standing it neither became hard or emulsionized. The action of HNO_2 fully corroborated this test in neither solidifying the oil nor separating crystalline particles of elaidin, thus proving it to be a *drying* oil, while, on the contrary, the true oil of almonds belongs to the class of non-drying oils.

Heated with HNO_3 the oil at first changed to a dark-yellow and finally to a reddish-brown color.

With H_2SO_4 the oil at first assumed a bright yellow color, which gradually changed to a dark purple, a test which, as well as the previous one with cold HNO_3 , would particularly indicate the presence of large quantities of poppy seed oil, while the reaction obtained by *heating* with HNO_3 would indicate probable admixture (though I think in a small degree) of the oil obtained from either the peach or apricot kernel, which, if present, might furnish the almond-like odor first noticed.

Chelsea, Mich., March 8th, 1878.

IMPURE MAGNESIA.

BY H. C. ARCHIBALD PH.G.

In the course of ordinary business, I had occasion to order from a wholesale druggist some heavy oxide of magnesium, for which there is

a great demand all over the city. Upon receiving the article in question, from its apparent bulk and grittiness I was induced to make a qualitative examination, which showed me that it was not a perfectly pure oxide, it dissolving with effervescence in HCl , and a precipitate forming with a solution of BaCl_2 , insoluble in excess of HCl . A quantitative examination was made to determine the amount of CO_2 it contained, and by volumetric determination with Scheibler's apparatus the amount of CO_2 was found to be 4.14 per cent., corresponding to 7.9 MgO.CO_2 . The amount of sulphuric acid present was found to be 1.1 per cent., equal to MgSO_4 1.6 or nearly 2 per cent. Na_2SO_4 , which is more than probable it was. The magnesia in question resembled in feel, and very much in appearance, the old magnesia alba of the shops, differing only in its greater density. It was not as unctuous to the feel as that prepared by Messrs. Powers & Weightman of our city, nor when taken was it near so palatable. I have been informed that the magnesia was of foreign manufacture, and was sold in good faith to the trade as being absolutely a pure oxide of magnesium of proper density, etc.

West Philadelphia, Feb. 27, 1878

QUINIA PILLS.

CAMP HALLUCK, Nevada, Feb. 14, 1878.

Editor American Journal of Pharmacy:

As I have often seen formulas in various medical journals for compounding pills of quinia, none of which seem to have been satisfactory, permit me to inform you that if a small quantity of powdered gum arabic be adued to the quinia and thoroughly mixed with it, and glycerin added, a few drops at a time, triturating well after each addition, it will make an excellent mass, which can be easily and leisurely worked into nice smooth and compact pills, which will remain unalterable indefinitely.

I have used the above-mentioned ingredients in the preparation of quinia pills nearly seven years, and think if they are tried perfect satisfaction will result.

Yours respectfully,

JAMES E. BRETT.

REMARKS ON PILULÆ CATHARTICÆ COMPOSITÆ, THEIR INGREDIENTS, AND THE PROCESS OF COATING THEM WITH GELATIN.

BY G. H. CHAS. KLIP.

The Pharmacopœia directs to make this pill with compound extract

of colocynth, in powder, $1\frac{1}{3}$ grain; extract of jalap (in fine powder), mild chloride of mercury, of each 1 grain; gamboge, in fine powder, $\frac{1}{4}$ grain—for one—which weighs $3\frac{7}{12}$ grs. For a good and active pill, it is of primary importance to use active and pure ingredients.

The compound extract of colocynth consists of $3\frac{1}{2}$ troyounces extract of colocynth, 12 troyounces of purified aloes, 3 troyounces of resin of scammony, $1\frac{1}{2}$ troyounce of cardamom and 3 troyounces of soap, all to be finely powdered and then intimately mixed.

One of the most active ingredients in this compound extract is the extract of colocynth. The Pharmacopœia has it prepared by macerating, for four days, 48 troyounces of colocynth, deprived of the seeds, with 8 pints of dilute alcohol, expressing strongly, packing the broken up residue in a percolator, and pouring on dilute alcohol until the percolate and expressed tincture mixed together measure 16 pints. Ten pints of alcohol are to be regained by distillation, the residue dried on a water-bath and reduced to a fine powder. The last time that I prepared the extract I proceeded as follows: 48 troyounces of colocynth (not of the best quality of colocynth, the fruit being of medium size, with quite a number of small ones, and some discolored and misshapen) were deprived of the seeds and yielded 15 troyounces of pulp, which was ground tolerably fine and macerated for five days with 4 pints of alcohol, this being just sufficient for complete immersion, if the powder is pressed down. The expressed liquid measured $3\frac{1}{2}$ pints. To ascertain the strength of the tincture the alcohol was regained by distillation and the residue evaporated to dryness; it weighed 3 troyounces. The expressed mass was then broken up thoroughly and packed in a percolator. If tightly packed, it was found percolation would proceed but very slowly. The alcohol that had been recovered was properly diluted and poured on. The bulk of the colocynth in the percolator increased fully one-fourth. 5 pints of dilute alcohol, altogether, was used. When 3 pints of percolate had been obtained, percolation ceased. The mass, subjected to powerful pressure, yielded $1\frac{1}{2}$ pint more of tincture, making in all $4\frac{1}{2}$ pints. The alcohol was regained from this, and the residue was evaporated to dryness on a vapor-bath; the yield was $2\frac{1}{4}$ troyounces, making a total yield of $5\frac{1}{4}$ troyounces from 48 troyounces of colocynth, or 15 troyounces without the seed. The extract was easily pulverizable in a flat-bottomed porcelain mortar.

Mohr, in his "Commentary on the Prussian Pharmacopœia,"¹ according to which this extract is obtained by two digestions of colocynth, the first with rectified spirit, sp. gr. '892, and the second the same diluted with an equal weight of water, says: "The yield of 15 ozs. of colocynth without seed is 2 ozs. 5½ drs. of dry extract."

Hager, in his "Commentary to the Pharmacopœia Germanica," states that "100 parts of peeled dry colocynth, of the inferior Cyprian or the better Egyptian kind, yields, after separating the seeds, 35 and 50 parts of pulp, and of dry extract from 10 to 15 or 20 parts." According to this, the inferior would yield to 15 troyounces of seedless colocynth at the least 4.27 troyounces, and the better kind 6 troyounces of extract.

The United States Pharmacopœia says: "The extract obtained by this process weighs about 7 ozs." Comparing the weight of the products of the different processes, the Pharmacopœia claims the largest. I will not say that 7 ozs. of extract from 48 troyounces of colocynth cannot be obtained; but if the soundest and fleshiest, in short the best colocynth is not used, such a yield would seem somewhat difficult to obtain. A colocynth as just mentioned is not readily obtainable. From 48 troyounces of common colocynth, which, deprived of the seeds, weighed 16 troyounces, I have by thorough exhaustion obtained 6 troyounces of dry extract; but in this case exhaustion was carried beyond the common limit, just to ascertain how much could be extracted.

There is some difference in the menstrua of the different processes. The Pharmacopœia uses dilute alcohol, sp. gr. '941; the Prussian Pharmacopœia directs rectified spirit, sp. gr. 0.894—0.890, and the Pharmacopœia Germanica the same, spec. grav., 0.892—0.893. I have used alcohol spec. grav. '825, and dilute alcohol spec. grav. 941.

Recapitulating, the yield of extract in per cent. from seedless colocynth by the several processes would be as follows:

Process,	U. S. P.	Ph. Ber.	Ph. Germ.	Own make.
Yield,	46.6	14.5	28.46 to 40.0	35.0 to 40.0 per cent.

Of the other ingredients in compound extract of colocynth, there is no difficulty in making purified aloes, and powdering it if sufficiently

¹ "Pharmacopœia Germanica," which has superseded the Prussian, has retained the same formula.—EDITOR.

dry. The resin of scammony, on account of its high price, is often adulterated. I have, off and on, heard it remarked that, by its entire omission from, it was most conspicuous in some of the compound extracts of the market. The *Pharmacopœia* gives tests for detection of adulteration in the resin. Cardamom, of the proper degree of fineness and purity, and a fine quality of powdered white soap, can be purchased in the market. Powdering soap is very disagreeable, if nose and mouth are not protected. The powder ought to be of the very finest quality, otherwise small specks of white soap are discernible in the finished extract.

The thorough mixing of the ingredients is accomplished by passing all through a fine sieve, then placing the powder in a bottle which it will fill one-half or two-thirds, and shaking for a minute or two. The finished extract ought to be kept in bottles, sealed, and in a cool place. If in warm weather it is kept in a common extract jar, it shows a tendency to cake. It turns several shades darker with keeping. It is infinitely superior to some extracts of the market, which often have the appearance of very coarsely ground coffee, and sometimes exhibit a decidedly burnt odor. To make a quantity of pills is one of the most tedious operations. You may commence pounding in the morning, and continue at it all through the day, and if you have a smooth, homogeneous mass by evening you are fortunate. If the exertion proves too much or too tedious, a pill mass is the result filled with smaller and larger grains of extract, which do not become pliable by any amount of subsequent rolling on the pill machine or kneading between the fingers.¹

Following is a table showing the difference of price between purchased extract and that of own manufacture :

One pound avoirdupois (7,000 grains) of extract

	Ext Coloc.	Pulv. Aloes.	Res. Scammon.	Pulv. Cardam.	Pulv. Sapon.	
Contains	1065.19	3652.08	913.02	456.51	913.02 grs.	= 6999.82 grs.
Costing \$	7307	3392	1565	1141	0773	= \$ 28263

At the market price of \$3.25, this leaves in favor of own make

¹ No difficulty whatever is experienced if the mass is made in a hot iron mortar; *very little* water should be used, and the mass rolled out while warm; or, if it has become cold and hard, it should be warmed again in an air-bath. If too much water is used, the pills will flatten on keeping.—EDITOR.

§0.42.37. In the above, extract of colocynth was reckoned at §0.30 an ounce, powdered aloes at §0.65 per pound, powdered resin of scammony at §0.75 an ounce, powdered cardamoms at \$1.75 per pound, and powdered soap at §0.60 a pound.

The second ingredient of compound cathartic pills is pulverized extract of jalap. In the directions for the preparation of this extract the Pharmacopœia says: "Evaporate to the proper consistence," *i. e.*, to an extract of such consistence that pills may readily be formed from it. If extract of this consistence is evaporated to dryness, a troyounce will lose about 52 grains. It is very difficult to preserve the extract in the state of powder, especially in warm weather.

Mild chloride of mercury and pulverized gamboge, the two other ingredients, can be procured, of excellent quality, in the market.

The perfect round form of compound cathartic pills is somewhat difficult to preserve. In warm weather they become flat, and when kept in a bottle, where they press one on another, assume irregular shapes. This is a characteristic of the pill, which is brought about by the resin contained in extract of colocynth and jalap. When resin of jalap is substituted for the extract the pills show the same characteristic. The pills made with extracts of own make, for medicinal action can be uniformly depended upon.

Below I give a list of comparative prices of pills made with purchased extracts and extracts of own make.

The weight of one pill being $3\frac{1}{2}$ grs., the weight of five hundred pills = $1,791\frac{1}{2}$ grs., or 3 troyounces, 5 drs. $51\frac{1}{2}$ grs.

500 pills contain of:	Grains.	Cost when prepared with purchased extracts.	Cost when prepared with extracts of own make.
Compound extract of colocynth	666 $\frac{1}{2}$	§0.31 00	§0.26.87
Extract of jalap	500	0.31.51	0.07.50
Mild chloride of mercury	500	0.06.25	0.06.25
Gamboge	125	0.01.56	0.01.56
	1791 $\frac{1}{2}$	§0.69.96	§0.42.78

Five hundred compound cathartic pills, U. S. P., sugar-coated, cost in the market \$1.35, and gelatin-coated \$1.65. If 25 cents is allowed for sugar-coating, and 55 cents for gelatin-coating, which is a liberal allowance, the plain pills will cost \$1.10, leaving a margin of \$0.40 for the pills made with the purchased extracts, and \$0 67.82 for the pills prepared with those of own make.

Compound cathartic pills can be kept in perfect shape and therapeutic qualities unimpaired, for any length of time, by coating them with gelatin. The coating of pills with gelatin is a somewhat tedious process. As is well known, it is performed by dipping them, adjusted to the ends of needles or short wires, into a solution of gelatin, and for drying, pressing the needles or wires into soft cork or a cushion. Finally, the small, sharp edged gelatin tubes left when the wires or needles are withdrawn are cut off with small scissors, and the orifice is closed with a minute drop of gelatin solution. The mass ought to be pretty tough if the compound cathartic pills are to be immediately coated with gelatin. The adjusting, dipping, etc., of these pills occasions no more work or extra amount of precaution than any other, but while drying a difficulty occurs. Substances during the process of drying contract. The gelatin coating of pills contracts powerfully while drying. The solution of gelatin, coming in direct contact with, and remaining, at least a short time, in a semi-fluid condition, softens the surface of the pills. When the coating dries, it contracts so powerfully that it is ruptured, and a small portion of the softened mass is forced through the rupture in the form of a small bead, or one might liken it to a minute tumor. As a consequence the appearance and weight of the pills is impaired. From 30 to 50 per cent. would thus rupture. When they were first coated with an ethereal solution of mastic and then with gelatin, between 20 to 30 per cent. would rupture.

The solution of gelatin was made, in a vapor bath, of gelatin, 1 part, and water, 2 parts; one dipping was found sufficient to form a good coating. I have had occasionally to coat other pills with this solution, but have not come across any that showed the same characteristics as the compound cathartic pills. The solution of gelatin, however, was improved to an extent that the coating of only from 4 to 6 per cent. of these pills would rupture, by the addition of $\frac{1}{2}$ part of pure glycerin.

During the dipping process it is advisable to keep the gelatin solution at a temperature between 140° — 150° F., and to turn the dipped pills backwards and forwards and sideways, so as to distribute the solution equally, until it has slightly congealed, otherwise it will gather on the lower side of the pill in a drop, and the coating on that side will be out of all proportion to that of the other parts. When the solution has to be kept on the fire for some time it will be found necessary to add water now and then to make up for that lost by evaporation.

Lorwell, N. St. Louis, Mo.

Remarks by the Editor.—In the calculations contained in the preceding paper, it seems that the items of labor and fuel have not been considered, and it appears to us very properly so, as long as the pharmacist manufactures for his own use, and without the employment of additional help can thereby advantageously turn to account hours of leisure, and utilize heat otherwise wasted.

It will be noticed that “powdered” aloes is accounted for, while the Pharmacopœia directs “purified” socotrine aloes. The purification may, at first sight, appear to be an unnecessary refinement, since impurities in that variety of aloes are not readily observable. But anyone who will undertake to purify a larger quantity of the drug will collect sufficient vegetable fragments, stones, goat skins and the like, as to induce him to change his mind. 3,342 $\frac{1}{2}$ lbs. of air-dry socotrine aloes, purified in different lots, lost 478 $\frac{1}{2}$ lbs. or 13.42 per cent., a good portion of which consisted of the impurities mentioned.

In making extract of colocynth on the large scale, the separation of the seeds is a practical impossibility, and even on the small scale the operation is tedious and incomplete, the immature and shrivelled seeds at least remaining firmly imbedded in the pulp. For this reason manufacturers crush the fruit with the precaution not to break the seeds. Thus prepared and treated with the officinal menstruum, 3,460 $\frac{3}{4}$ lbs. of commercial colocynth of average good quality have yielded us 495 $\frac{1}{2}$ lbs. of dry extract, equal to 14.32 per cent. The details of the different operations are now not accessible to us, but they doubtless agree closely with those of Dr. Squibb (see “Am. Jour. Phar.,” 1867, p. 16), who obtained from 9951 $\frac{1}{2}$ lbs. of colocynth 1349 $\frac{1}{4}$ lbs. = 13.56 per cent. of extract, the highest yield being 16.2, and the lowest, in an exceptional case, 11.3 per cent. Dr. Squibb (*Ibid.*, 1857, p. 98) also records

a yield of 20·6 per cent. from colocynth, which had been kept for three years in a dry store-room. This large yield was doubtless due to the more complete drying of the fruit. The important influence of the moisture naturally contained in drugs on the quantitative yield is often not sufficiently taken into account, but may be readily gleaned from the paper by Mr. G. W. Kennedy in "Am. Jour. Phar.," 1874, p. 174.

BENZOIC ACID IN PHARMACY.

BY B. ARCHER.

Within the past two or three years the comparative merits of the various anti-ferments have been pretty thoroughly discussed, and the result has been to place benzoic acid first on the list. At present its use is limited to only a few officinal preparations, but there is no doubt it may be advantageously used in quite a number. In the next revision of the Pharmacopœia I would suggest, among the additions, that of benzoic acid water (gr. iv to Oi) and its substitution for water in such *syrups, infusions, decoctions* and *mixtures* as are specially prone to decomposition. The instances in which there could be objection, either chemical or therapeutical, to such substitution, would be rare, as it is harmless and will not materially affect the taste, odor or color of the preparations. While benzoic acid in the small quantity here suggested will not make *very instable* preparations *permanent*, it will so increase their stability that they may be kept as long as it is usually desired to keep them. Some have recommended salicylic acid as an antiseptic, but this will not do for general use on account of the color imparted to mixtures containing the salts of iron, and, besides, as an anti-ferment it is not the equal of benzoic acid.

I have found the benzoic acid water especially useful in preparing solutions for hypodermic use. The small vials of such solutions carried in the pockets of physicians, and thus kept at a high temperature soon undergo change unless protected by some antiseptic. It may not be out of place to say just here that physicians, who do not have daily use for their hypodermic syringes, are often annoyed by the packing becoming dry, and, consequently, so contracted that the piston will not work smoothly in the barrel. This annoyance may, to a great extent, be overcome by the addition of a few drops of glycerin to each fluid-ounce of hypodermic solution.

In extemporaneous pharmacy it is often more important that the diluent in mixtures should play the part of an antiseptic than that of a mere flavoring ingredient, for it is a fact well known to all observing pharmacists that many of the mixtures, emulsions, etc., dispensed by them must become unfit for use, especially in the summer months, before all is taken by the patient. In dispensing such mixtures, benzoic acid water may well replace water or the medicated waters. I have substituted benzoic acid water for water with great satisfaction in preparing solution of citrate of magnesium, mucilage and syrup of gum arabic, Jacksons' Pectoral Syrup, and many other officinal and unofficial preparations which I need not enumerate.

The present formula is a most expeditious method of preparing syrup ipecac, but this is all that can be said in its praise. It should be changed or else that for the fluid extract so modified as to yield a handsome preparation when mixed with syrup. By adding two fluidounces of the fluid extract to one pint of benzoic acid water, filtering upon twenty-six troyounces of sugar, and making two pints of syrup when cold, a beautiful and permanent preparation is the result.

There can be no doubt of the fact that benzoic acid contributes to the preservation of cerates, ointments and all unctuous substances, but whether or not the difficulty of stability is entirely overcome by its use, and the smallest quantity necessary to accomplish it, I am not prepared to say. It has been stated that the addition of five per cent. of powdered benzoin to powdered ergot will preserve without alteration its physical and medicinal properties. Acting upon this suggestion, I added two grains of benzoic acid, dissolved in a few drops of alcohol, to one ounce of powdered ergot, mixed thoroughly and spread the powder on a sheet of paper an hour or two to allow evaporation of the alcohol before bottling. Sufficient time has not yet elapsed to say whether or not the ergot is thoroughly protected by this treatment, but from its present condition there is no doubt that deterioration is at least greatly retarded.

The instability of sweetmeats, preserves, marmalades, etc., is annually a source of much annoyance to housekeepers. If sugar enough is added to prevent change during the summer months, when the jar is opened in December, they find a mass of *candied* fruit; while, if to prevent this trouble, a smaller quantity of sugar is used a few weeks of hot weather will produce lively fermentation. Four grains of benzoic

acid, dissolved in a little boiling water, added to each pound of preserves, while yet warm, will protect them without imparting any "physicky" taste.

Norfolk, Va.

ON A DEVICE FOR PERFORATING PLASTERS.

BY JOSEPH P. REMINGTON.

(*Read at the Pharmaceutical Meeting, March 19.*)

Porous plasters have been used so extensively, and their merits of furnishing external medication, whilst permitting the escape of exhalations from the skin, are so well known and appreciated that the notice of the expiration of the patent, which was circulated a few years ago, was to many pharmacists a welcome one. Since this time several manufacturers have been very industrious in increasing their lists of ready-made plasters, and now the varieties are numbered not by ten but by hundreds.

The introduction of rubber into the basis of spread plasters marked an era, and the advantages soon grew to be appreciated. First, the plaster was rendered much more flexible and, hence, more comfortable to the wearer, the stiff, often brittle combinations in use were rapidly replaced. Secondly, by a peculiar combination the plaster remained soft and could be applied to the skin without application of heat, and thus it was fair to presume that, if a plaster was adhesive at ordinary temperature of the air, it would be very apt to stick to the skin, which usually has a temperature of 98.6°F.

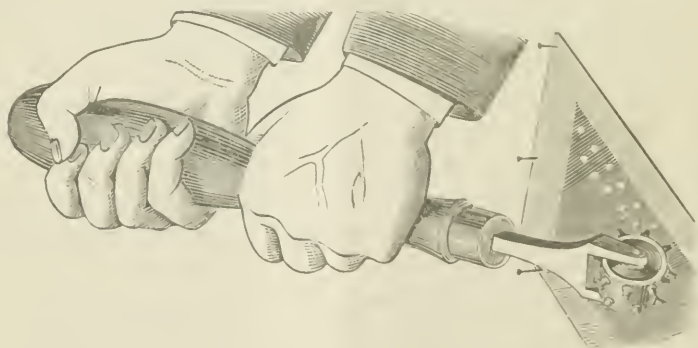
Thirdly, when to the above valuable points was added perforation, or as it is technically termed, "porousing," it was believed that perfection was attained.

One of the principal reasons for the decline in the demand for plasters spread by the apothecary has undoubtedly been the superiority of the porous plasters furnished by the manufactures on a large scale and machine-made; the patient recognized this fact and called for them—the apothecary was usually too glad to be relieved of what is almost always regarded as one of the most disagreeable duties of the shop, and hence the prosperity of the manufacturers.

But the same causes which undermine so many industries in our country (as in others) is actively at work among the plasters. Competition, and the demand by apothecaries for cheaper products, has resulted

in depreciating the quality of the plasters furnished until *now* in the case of belladonna plaster (probably the most used); the principal manufacturers of rubber combination plasters will each furnish a plaster labeled in bold type belladonna plaster, which they will admit contains *no belladonna extract*. They do sell a higher priced plaster which professedly contains the officinal proportion—but does not *this policy* tend to sow distrust in the minds of buyers? How can a conscientious pharmacist dispense them as standard goods when he knows that plasters stamped with a lie *are* sold, and that he has no means of knowing the true from the false without an investigation, which would not occur to every one to institute; and then the facts in the case are usually reluctantly admitted.

It is owing to the lack of medicinal effect in manufactured plasters that physicians in many sections prefer to undergo the inconvenience, of the hand-made plaster, and prescribe it because they feel sure of getting what they want, and the writer has endeavored to supply one deficiency in the hand-made plaster by the following device, whereby any apothecary may *porous* the plaster which he has spread, irrespective of its size or shape or material upon which it is spread.



This device or *tool* consists of a brass cylindrical wheel, $\frac{3}{4}$ in. wide, $\frac{1}{2}$ in. in diameter, with two circular depressions turned out of each end, $\frac{1}{4}$ in. deep, leaving a hub on each end of wheel, through which a steel axle passes into the prongs of steel handle, which is driven into an ordinary tool handle 9 inches long.

The cylindrical wheel is studded with 16 punches, arranged on either side $\frac{1}{2}$ in. apart alternately; these punches are of steel, tapered and are $\frac{1}{4}$ in. long, and $\frac{1}{8}$ in. bore at the end making a $\frac{1}{8}$ in. perforation.

To operate the tool all that is necessary is to dip it first in water, then having secured the plaster firmly by tacking it to several layers of old newspapers on a rather low counter, grasp the tool tightly with both hands and drive the punches with some force through the plaster, pushing it along, *from* the operator, the wheel revolving as it is pushed forward, the little disks of plaster collect in the punches, stick together and form a core, which falls towards the axle of the wheel and is driven out by the inclined hub.

A cheaper tool could be made with but one series of punches arranged on the wheel, but two series have the advantage of doing the work more quickly, and less skill is necessary to operate it.

Hand-made plasters, spread on kid, may be perforated in this way by hand, and physicians may order any combination that they may desire, and secure one of the advantages of the machine-made plasters. The tool should be cleaned with cloth moistened with a little turpentine, and kept in a box to prevent punches from being injured by coming in contact with hard objects.

Philadelphia, Third mo. 18th, 1878.

VARIOUS NOTES.

BY X. LANDERER, Athens, Greece.

A Useful Bird.—A raven (*Corvus fructilegus*) is in the habit of burying the acorns of *Quercus ægilops* by the thousands to serve as food in the winter time. As the bird generally forgets where he buries them, the acorns soon germinate and grow up to stately trees, and in this way the raven contributes very materially to the welfare of hundreds of families and thereby to that of Greece, since the cups (*valonia* of commerce, which are much used in tanning and dyeing) represent an annual income of three to four million drachms. The name *ægilops* comes from *aix* (a goat), and *opsis* (eye) from a supposed resemblance of the cupula to the eye of a goat.

Heron's Fat.—A popular remedy with the Greeks and Turks is the fat from the neck of several species of heron (*Ardea cinerea*, *egretta*, etc.), which is used as an embrocation against whooping cough and scrophulous swellings. The beautiful, and, in many countries, so highly-priced plumage of those birds is thrown away, and thus one source of income neglected.

Artichokes, the unexpanded flower-buds of *Cynara scolymus*, *ankynaros* of the Greeks, are among the most favorite vegetables in the Orient. The juice colors the skin a beautiful reddish-brown, which color is with difficulty got rid of. The involucral scales are used for dyeing the hair brown, also for staining wood of a mahogany color. The name *cynara* is supposed to be derived from *kyon* (dog), because the scales of the anthodium are hard and pointed like the eye-teeth of a dog.

Adulteration of Ferrum Hydrogenio Reductum.—A sample offered for analysis had a blueish-black color, and, under a magnifier, could be distinguished small light-blue grains. Boiled with liquor potassæ, cyanide of potassium was formed and red hydrated oxide of iron, thus showing that the iron in question had been prepared by insufficient ignition of ferrocyanide of iron (Prussian blue). Its proper name would be *Æthiops martialis* or *Ferrum oxydulatum cum carbone*.

Catching Fish by Poisoning Them.—Although the laws of Greece are quite severe respecting the use of poisonous substances in fishing, different species of *Euphorbia* are generally resorted to, occasionally also *Cocculus indicus*. Once a seal (*Phoca vitulina*) was found stupefied by feeding on poisoned fishes, and as its oil is very generally used in Greece as a substitute for cod-liver oil, it can be easily understood that the above-named practice must be considered as quite dangerous, so much the more so, as the meat of poisoned fishes easily spoils.

Pitch is collected in the Orient from *Pinus maritima* and *Cephalonica*, and is used in millions of okkas for making pitch-wine (*retsinato*, which has been in use since the time of Homeros). The collectors (*retinolektes*) are not content with making incisions through the bark, but cut deeply into the wood itself, sometimes nearly half way through the trunk. Trees mutilated in this way are destroyed in a few years and present a curious appearance, since the leaves on one side are withered and rust-colored, while on the opposite side they are still green.

Substitutes for Quinia.—Although quinia is the only reliable remedy for the chronic fevers of the Orient, its high price forbids its use among the poorer classes, and therefore several substitutes are resorted to. Physicians use often with success an extract of olive leaves and immature olives, made with diluted sulphuric acid. A popular remedy with poor people is Cayenne pepper, in doses of one to two drachm with rum or mastichonaki.

Pistacia Terebinthus.—A strong decoction of the leaves of this tree has been found very useful in albuminuria, and I have known a patient whose urine was so much loaded with albumen as to give quite a consistent milk on the addition of nitric acid ; but after several weeks' persistent use of the above-named decoction, did not show even a trace of albumen. *Pistacia terebinthus* yields by incision Chian turpentine, and is not to be confounded with *Pistacia lentiscus*, which yields mastix, nor with *Pistacia vera*, from which come the well known pistachio nuts of the confectioners.

Adulterations.—Powdered drugs are generally imported into Greece from France, and are not unfrequently adulterated. Powdered jalap has been found mixed with various powders, amongst them with the residue from the preparation of the resin ; lycopodium with over 50 per cent. pollen of pinus ; cubebs with the residue from the preparation of the extract, and flavored with oil of pennyroyal ; rhubarb with powdered rhapontic and other allied roots, etc.

Orobanche (*grandiflora* and *caryophyllacea*) is one of the greatest nuisances the Greeks and the Eastern people generally have to contend with, since it is a parasite and eventually destroys leguminous plants, which, particularly beans, form the staple food of these people. The ancients called all leguminous fruits *kyamos* or *orobos*, and a temple was dedicated to Apollo Kyametes. The name orobanche is derived from *orobos* (leguminous fruit), and *anchein* to choke ; English *broom-rape*.

Shell-fish.—In probably few countries are there consumed in lent more shell-fish, chiefly *Pinna nobilis*, than in Greece. In each pinna is to be found a kind of silken appendage which in Italy is made use of by the poorer girls and women to make purses, necklaces, ear-rings, etc., and thus proves no mean source of income to hundreds of families. In Greece, on the contrary, these silken tissues are thrown away ; the pearls which are occasionally found with it, however, being collected ; otherwise the pinna is only used for its meat. The shell would yield excellent lime on being calcined.

Terra sigillata, *T. Lemnia* and *T. miraculosa* Saxoniz, are argillaceous earths which were well known to the older pharmacists. The Lemnian earth is still largely used in the Orient as an absorbent, and comes in the form of troches, sometimes gilded and bearing the impression of a Turkish seal. They are much used together with a decoc-

tion of mastic as an infallible remedy in cholera infantum. Externally is applied a poultice of bread, boiled in strong red wine, and mixed with powdered aromatic herbs. These poultices are called *Krasospoma*, from *krasi*, wine, and *psoma*, bread.

Ink (*melani*) is generally used by the Orientals for burns and scalds. It is applied in a thick layer, and often leaves a permanent mark.

Enchantment.—To guard valuable horses against the “evil eye,” a large crystal of sulphate of copper, enclosed in a silver box, is suspended from the neck of the animal. This is called *filakta*. Against bewitchings and enchantments, the stables are very generally fumigated with *asafoetida*, *galbanum* and other ill-smelling substances.

Veterinary Surgery.—Although there exist in Greece about one million horses, twelve to fifteen million sheep and goats, two million asses and mules, and so on, there is as yet no veterinary school in the country; only five or six regularly educated veterinary surgeons are to be found. Besides these there are many self-taught farriers, called *albanides*, whose cures very often are successful.

Falling out of hair is prevented in the Oriental countries by using an ointment consisting of the bruised fresh bulbs of *Asphodelus bulbosus* or of garlic, onions mixed with gunpowder. An infusion of small leaves of the lemon or orange tree in red wine has likewise proved serviceable, about twenty grains of tannin having been added to the liter of this aromatic wine.

Jaundice is cured by drinking freely of a strong decoction of the flowers of *Tamarix africana* (*myriki*). Some native empirics use gold (*chryson*), the Greek name for jaundice being *chrysi* (golden disease). They get a few gold pieces from the patients, put them in a yellow liquid, when, by some hocus-pocus, the gold pieces disappear, and are to be found in the pockets of these charlatans (*bekim*).

Spartium junceum (*hinosparton*, *sparton* of Dioscorides and Theophrastus) in a strong decoction, is considered a sovereign remedy for diseases of the urinary organs, particularly stone in the bladder.

Elektron, the Greek name for amber, is probably derived from the Phenician *elek*, which signifies a resinous exudation. The Arabs of the present day call amber *elek*.

Olives of the unusually large size 2 to $2\frac{1}{2}$ inches in diameter are occasionally met with. The trees, which bear only few fruits, are said to have come from the island of Rhodus.

Two new industries have, of late years, sprung up in Greece. Until recently the lees of wine (*katapatia*) were thrown away, and thus thousands of kilos of tartrates lost. In the last three or four years the lees, dried in the sun, have been exported to Italy, where they are converted into cream of tartar. This industry might be much enlarged were it not for the pernicious habit of the Greeks to "pitch" most of their wines, particularly those of the Peloponnesus, which makes the lees unsalable.

Of late the Greeks have introduced the use of bisulphide of carbon for extracting all the oil from the olives after they have been expressed. Oil extracted by this means is called *pyrenelaion*, from *pyren*, a kernel.

Change of Color of Hair.—One case has been observed where the red hair changed, two or three hours after death, to blond, and within thirty hours to gray.

Extractum Ferri Pomatum.—Owing to the scarcity, if not the absence, of sour apples in Greece, it is proposed to substitute grape juice instead, and thus make an *extractum ferri uvicum*.

Emery.—In Smyrna they use the following test for determining the quality of emery. One grain is rubbed on a previously accurately weighed glass plate with a glass pestle until no more glass is ground off. The plate is washed off, dried and weighed; the greater the difference the higher the quality of the emery.

Mineral Springs.—Visitors to mineral springs often seek dissipation rather than relief from sickness. Those who need the latter are recommended to use plenty of exercise, and, instead of most mineral waters, drink sea water in small doses, either pure or diluted with more or less fresh water, as a cheap substitute for the former, the expenses for traveling, etc., being thus also avoided.

ON the DISTINCTION of the CINCHONA ALKALOIDS.¹

BY DR. RICHARD GODEFFROY AND C. LEDERMANN.

The price-currents of different German drug houses frequently quote several cinchona alkaloids under very different and often arbitrary names, which occasionally are well adapted to cause confusion or mistakes. Thus we find *quinidia* (or *conchinin*) *sulphate* quoted as *chininum sulfuricum* Bi, or B, or b, or β , or as *chinidinum sulfuricum purum verum*, etc., and *sulphate of cinchonidia* as *chininum sulfuricum* B or Bii, *chinidinum sulfuricum*, or I ma, etc.² To distinguish the various cinchona alkaloids from each other appears to be the more important since quinia sulphate commands a high price in the market, and an adulteration or substitution of it with the cheaper sulphates of cinchonidia and quinidia is not impossible.

The microscope alone enables us to test the purity of quinia sulphate quickly and accurately. Stoddart and F. Schrage have published some interesting information in this direction; but, since they have confined their researches only to quinia, cinchonina and quinidia, and since it is uncertain whether the latter term was intended for cinchonina (quinidia) or cinchonidia, the authors deemed further researches advisable, and observed that F. Schrage must have made some statements partly incomplete and partly incorrect.

The method of microscopic examination by Stoddart and Schrage is based upon the characteristic reactions of the cinchona alkaloids with potassium sulphocyanide. For the success of the reaction there are required a concentrated solution of the potassium salt and a solution of the salt of cinchona alkaloid, saturated at the temperature existing at the time of the examination. For salts which are difficultly soluble, Schrage recommends a solution saturated at a temperature 10°C. higher than that of the atmosphere. According to the authors this is wrong, since in the manner stated microscopic pictures are obtained which are at variance with the appearance of the reaction. The preparations used by them were the pure sulphates of the four alkaloids manufactured

¹ Translated and abridged from "Archiv der Pharmacie," Dec., 1877.

² This confusion in the nomenclature of the cinchona alkaloids is unknown in the United States, where the nomenclature, as corrected by Pasteur's researches in 1853, has been generally adopted, and where, therefore, no excuse existed for the introduction of the term *conchinin* for quinidia, as proposed by Hesse in 1869, and now beginning to be employed in Germany.—EDITOR AM. JOUR. PHAR.

by Merk of Darmstadt. Of each a saturated aqueous solution was made, and filtered only when needed for the microscopic examination. When a drop of the filtrate is placed upon a glass slide and mixed with a drop of the solution of potassium sulphocyanide a white turbidity is at once produced, which is faintest when quinia sulphate is used. Examined under the microscope with a magnifying power of 110 diameters, the following is observed :

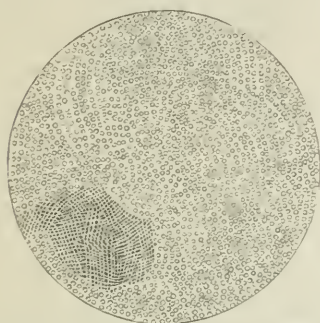


Fig. 1. Quinia Sulphate with KScy.

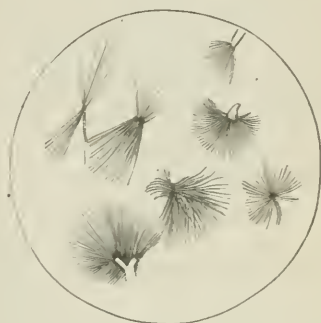


Fig. 2. Quinia sulphate.

1. *Quinia Sulphate*.—Small globules or round vesicles, which even after a day do not unite and form neither groups nor crystals (Fig. 1). Schrage described stellate groups of thin needles or spikes, which were also observed by the authors when working after Schrage's directions, but only in that portion of the liquid which had *not* become milky,

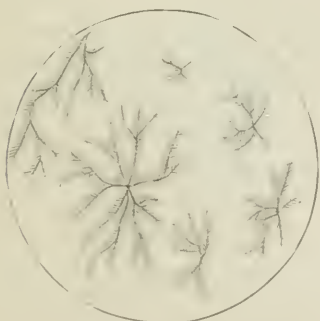


Fig. 3. Quinidia sulphate with KScy.



Fig. 4. Cinchonia sulphate with KScy.

while the latter contained only the described globules or vesicles. The stellate groups (Fig. 2) were, by comparison, recognized as quinia sul-

phate. The above minute globules were also obtained with valerianate and acetate of quinia, and in one case spike-like crystals appeared, which were due to an admixture of cinchonidia salt.

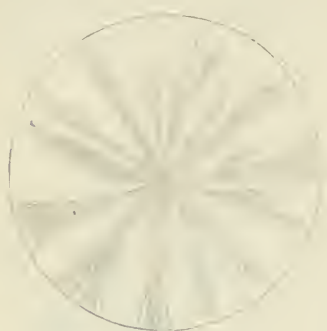


Fig. 5. Cinchonidia sulphate with KScy. Fig. 6. Cinchonidia sulphate with KScy.

2. *Quinidia Sulphate*.—Crystals are at once observed united into striking groups (Fig. 3). They are of a brownish-yellow color in transmitted light, and in general resemble Schrage's quinidia crystals.

3. *Cinchonia Sulphate*.—Long radiating crystals, mostly considerably branched (Fig. 4), and resembling antlers or equisetum. They agree with one of Schrage's pictures, and with the other only in the presence of cinchonidia.

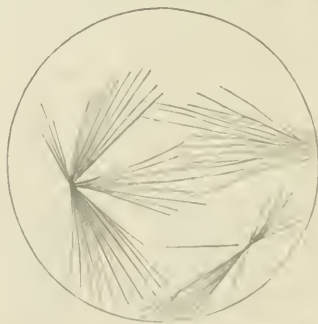
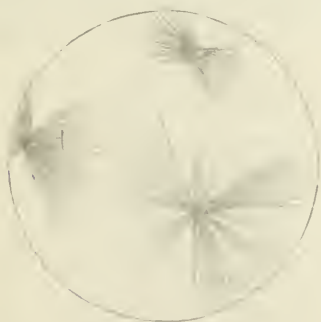


Fig. 7. Cinchonidia sulphate with KScy. Fig. 8. Cinchonidia sulphate with KScy.

4. *Cinchonidia Sulphate*.—The crystals, which appear at once, form either dense tufts stellately arranged around a central point (Figs. 5 and 6), or uneven, thin spike-like crystals, which are united into "star-like" (Fig. 7) or fan-shaped (Fig. 8) groups.

By means of the microscopic examination described, the cinchona alkaloids may not only be distinguished from each other, but the difference in the crystalline form will likewise detect all impurities and adulterations; and this method is the more important as, for the latter purpose, the so-called wet way is much more tedious, though by no means superfluous. When purchasing a quinia salt the authors recommended to dissolve about .1 gram of it in 10 or 15 cc. of chlorine water, and add two or three drops of ammonia. If an emerald-green color is produced quinia or quinidia, or both, are present, but possibly also cinchonina or cinchonidia. The microscopic examination described gives the best results. The authors made about twenty mixtures of quinia sulphate with variable quantities of the other three alkaloids, the presence of which was in every instance revealed by the microscope.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

Preparation of Pure Scammony Resin.—E. Perret recommends to exhaust the scammony with boiling alcohol, and to neutralize the alumina and lime of the blackish liquid, which has an alkaline reaction, with a few drops of sulphuric acid, whereby a colored precipitate is obtained, leaving the supernatant liquid colorless. The clear filtrate is distilled, the residue completely dried at about 104°C. (219°F.), and, while still warm, poured upon a marble slab; when cool it is powdered and yields a white and very dry product.—*Bull. Soc. Chim. Phar.*, N. Ser. xxviii, p. 522—*Jour. de Phar. et de Chim.*, Feb., 1878, p. 120.

Suppositories Containing Extracts.—Paul Petit obtains perfect suppositories by the following method: the extract is liquified in a porcelain capsule, with a small quantity of water, and animal soap, equal in quantity to the extract, is added; the solution is evaporated at a moderate heat to a syrupy consistence, and fused together with the requisite quantity of cacao butter; the mixture is well agitated until it commences to solidify, when it is poured into well-cooled moulds. With a little care, the suppositories thus prepared, are perfectly homogeneous and uniform in color.—*Jour. Phar. d'Anvers.*, 1877, p. 300.

Soluble saccharate of iron, Ph. Ger., is rather tedious to prepare on a somewhat larger scale, the precipitation by boiling water, the settling of the precipitate and the washing, consuming much time; but when

the mixture of soda solution, ferric chloride and simple syrup is poured into three times its volume of strong alcohol, a resin-like precipitate is deposited, which is readily washed by alcohol, and converted into a dry powder with the requisite quantity of sugar.—*Archiv d. Phar.*, Jan. 1878.

Dispensing of Monobromated Camphor.—Lépage recommends to dissolve monobromated camphor in six times its weight of expressed oil of almonds, and emulsify the solution in the usual manner.—*Four. de Phar. et de Chim.*, June, 1877, p. 535.

Bibromide of Acetic Acid.—Bromine 54 grms. and glacial acetic acid 20 grms. do not react upon each other at the ordinary temperature ; but in the presence of a very small quantity, 4 to 10 drops, of carbon bisulphide, the mixture becomes warm and finally congeals. The compound forms orange-colored thin needles, or thicker pale-red crystals, which fuse at about 36°C ., have a pungent odor and are very deliquescent, producing a red liquid, which, by water, is decomposed into bromine and acetic acid. It is also soluble in carbon bisulphide, but more freely in chloroform, benzol, ether and alcohol ; its composition is $\text{C}_2\text{H}_4\text{O}_2\text{Br}_2$.—*Ber. deutsch. Chem. Ges.*, 1877, p. 2103.

The distillation of castor oil, when carried on under a pressure diminished by the action of a water-air-pump, yields at first about one-third of its volume of an oily liquid, nearly one-half of which is *ananthol*. On continuing the heat, the thermometer rises more than 100°C ., and a crystallizing body is obtained, which appears to belong to the oleic acid group, and to have the composition $\text{C}_{11}\text{H}_{20}\text{O}_2$.—*Ibid*.

Salicylate of Zinc.—Ferdinand Vigier prepares it by mixing salicylic acid with distilled water in a porcelain capsule ; the mixture is heated to boiling and small quantities of oxide of zinc added, previously diffused in a little water. The solution is readily effected and when the zinc oxide ceases to dissolve, filtered and cooled ; the mother liquor is evaporated at a moderate heat, and again set aside to crystallize. If the heat of the concentrated solution is raised to boiling, a decomposition into a sparingly soluble basic zinc salicylate takes place. The contact with iron, and other metallic substances, must be scrupulously avoided.

The normal zinc salicylate occurs in glossy, satiny needless, having a sweet, somewhat styptic and bitter taste ; it is very soluble in hot

water, in alcohol, ether and methylic alcohol. Its composition is $C_{11}H_5O_5ZnO + 3aq$, and it contains 23.95 per cent. zinc oxide. It has been employed as an antiseptic astringent in the blennorrhagia, purulent ophthalmia, etc., the solution containing 0.5 to 4 grms. of the salt to 100 grms. of distilled water.—*Jour. de Phar. et de Chim.*, Jan., 1878, p. 41.

The transformation of glycerin into glucose has been reported by C. Kosmann, and was asserted to have been accomplished by four processes, in all of which the reduction of Fehling's solution was regarded as sufficient proof of the presence of glucose. L. Liebermann has repeated the experiments and found the reducing action due in two cases to the presence of ferrous oxide, caused by the oxidation of iron (on digesting lard or glycerin with sheet iron), or of manganous salt (resulting by treating aqueous glycerin with permanganate of potassium in *the cold*), or of chromic hydrate remaining dissolved in the glycerin; the latter was obtained by the action of solution of potassium bichromate and sulphuric acid upon glycerin, and, subsequent, neutralization with sodium carbonate. Liebermann recommends caution in testing urine for glucose, since iron preparations are frequently used in medicine.

Redtenbacher has previously observed that glycerin, in contact with yeast, evolves a gas, producing at the same time metacetic acid without undergoing alcoholic fermentation.—*Ber. d. deutsch. Chem. Ges.*, 1877, p. 2095.

Atropia and Daturia.—A. Poehl has investigated the cause of the well-known and generally acknowledged difference in the medicinal activity of commercial atropia and its salts, which Hager has been inclined to attribute to the presence of another alkaloid, probably belladonna. The supposed chemical identity of atropia and daturia, asserted by Planta, has led to the practice of preparing atropia not only from the root and leaves of belladonna, but, likewise, from the leaves and seeds of stramonium. Poehl has recently again examined the two alkaloids prepared by himself and found the following differences:

Atropia is optically inactive, but daturia turns polarized light to the left, its specific rotating power being -14.12° . Atropia salts are precipitated by platinic chloride, but daturia salts are not affected by the same reagent. Atropia salts are not precipitated by picric acid, which, however, precipitates daturia salts. The two alkaloids are therefore

chemically not identical, and the differences in the physiological action of commercial atropia is doubtless due to the absence or presence, in larger or smaller proportion, of daturia.—*Chem. Centralbl.*, 1878, No. 7—*Petersb. Med. Wochenschr.*, 1877, No. 20.

Morphiometric Examination of Opium.—Prollius recommends to prepare a tincture of opium of official strength, using, however, 34 per cent. alcohol. 100 parts of the tincture are agitated with 50 parts ether and 2 ammonia and then set aside. The liquids separate slowly, and retain, partly in the ether, partly in the alcoholic liquid, the coloring matter, narcotin and other crystallizable constituents of opium, while the morphia separates in crystals between the two layers and finally sinks to the bottom. The fluid portion is decanted, the crystals are washed with a diluted alcohol, dried and weighed. This method has the advantage over Guillermond's, in the use of a weaker alcohol and the addition of ether.—*Phar. Cen. Halle*, No. 2—*Schweiz. Wochenschr.*

Pao-Pereira.—This Brazilian tree belongs to the Apocynaceæ and has been variously designated as *Picramnia ciliata*, *Vallesia punctata*, *Tabernaemontana laevis* and *Geissospermum Vellozii*; after examining the leaves and stems, Baillon referred it to *Geissops. laeve*. The very bitter bark contains an alkaloid which was obtained by Santos in 1838, and named pereirin, but is now proposed to be called geissospermia.

Bochefontaine and DeFreitas have found the leaves to be likewise bitter and to contain the same alkaloid, though in less quantity. The alkaloid, as used in Brazil, is not pure but occurs as a brownish-yellow amorphous powder. The authors found geissospermia to be a toxic substance, exercising no local irritant action when administered subcutaneously; it is a poison which acts by destroying the physiological properties of the central nervous grey matter.—*Phar. Jour. and Tran.*, Sept. 8, 1877—*Comp. Rend.*, lxxxv.

Geissospermia has likewise been obtained by O. Hesse, independently of the above named authors. It occurs in small white prisms, easily soluble in alcohol, nearly insoluble in ether and water, but readily soluble in dilute acids. Concentrated nitric acid dissolves it with a purple color, passing, when heated, to orange yellow. Concentrated sulphuric acid dissolves it, the solution becoming gradually blue and finally again colorless; in the presence of iron the solution is at once blue, but likewise becomes colorless. The dark-blue color, with

sulpho-molybdic acid, remains unchanged after 24 hours. Its composition is $C_{19}H_{21}N_2O_2 + H_2O$.

The bark contains also a greyish-white amorphous alkaloid, which is readily soluble in ether, colors nitric acid blood-red and pure sulphuric acid violet-red; the name pereirina is proposed for it.—*Ber. d. Chem. Ges.*, 1877, p. 2163.

LIQUEFACTION OF GASES.

Almost simultaneously, and entirely independent of each other, the liquefaction of oxygen was accomplished in December, 1877, by L. Cailletet of Paris and Raoul Pictet of Geneva. Cailletet's letter to the Academy of Sciences announcing his discovery was dated December 2, sealed by the permanent secretary on the following day, and read before the Academy December 24, when Mr. Dumas announced that

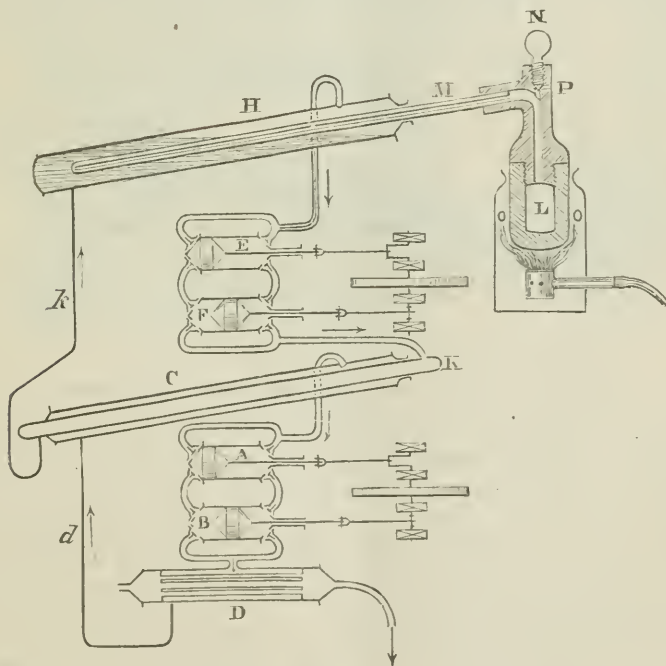


Fig. 1.

the same result had been accomplished by Pictet December 22, of which he had been informed by telegraph.

The liquefaction of one of the hitherto so-called "incoërcible" gases having been accomplished, it was followed before the close of the year by similar results obtained by Cailletet with the remaining two, nitrogen and hydrogen, the latter of which was solidified by Pictet January 9; atmospheric air has likewise been liquefied. The following description of the apparatus with which these results were accomplished has been condensed from "Jour. of the Franklin Institute," to which we are likewise indebted for the cuts.

Pictet's apparatus, Fig. 1, contains two pairs of pumps, *A* and *B*, so coupled that while one exhausts the other compresses. One pair operates upon liquid sulphurous anhydrid contained in the annular recipient *C*, its evaporation reducing the temperature to $-65^{\circ}\text{C}.$; the gas is pumped into *D*, where it is condensed by pressure and cold water, and returns through *d* to *C*. The other pumps remove from the annular recipient, *H*, liquid carbonic acid, the evaporation reducing the temperature to -140° , and force the gas into *K*, where it is recondensed by pressure and cold, the liquid flowing through *k* again into *H*.

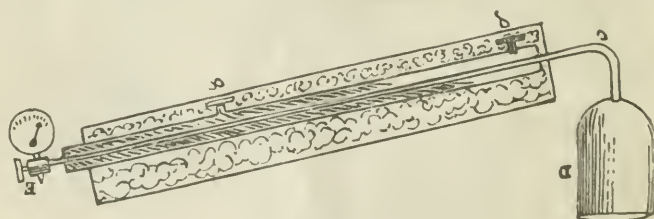


Fig. 2.

L is a wrought-iron retort resisting a pressure of 500 atmospheres, in which oxygen is generated from a mixture of chlorate with chloride of potassium. When the pressure in the tube *M* has reached 320 atmospheres, the temperature of the contents being -140° , the removing of the plug *N* opens the orifice *P*, through which the oxygen escapes with violence, producing an absorption of heat sufficiently great that a part of the gas liquefies in *M*, and is thrown out in a liquid jet from the orifice if the apparatus be inclined.

The same retort, tube and condenser are shown in Fig. 2, in which the entrance of the liquid carbon dioxide is shown at *a*, and the exit of the vapors withdrawn by the suction pump at *b*. Instead of the orifice in the tubulure of the retort the condenser is closed with a screw valve, *E*, which connects with a manometer, graduated to 800 atmospheres.

Since isomorphous bodies have the same atomic volume, equivalent divided by density, and oxygen belongs to the group of sulphur, the atomic volume of which is $\frac{32}{2}=16$, according to Dumas the density of solid, and probably also of liquid oxygen, should be $\frac{16}{16}=1$. Pictet has verified this by determining that a tube of 46.25 cc. capacity held 45.467 grams of liquid oxygen, the slight difference of .8 gram being probably due to incomplete filling or slight variation in temperature.

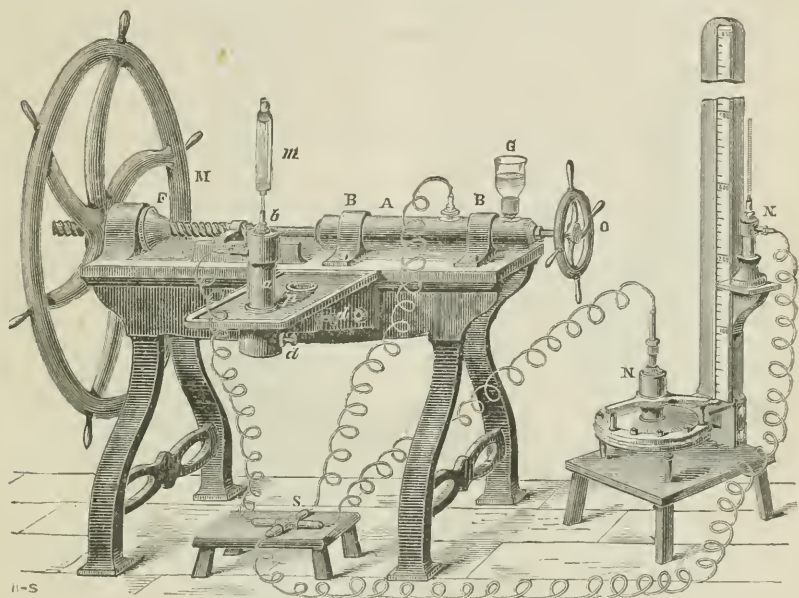


Fig. 3.

Cailletet's Apparatus.—The hollow steel cylinder *A* is fastened to an iron frame by the straps *B*, and when filled with water through the cup *G*, a very high pressure may be produced in any vessel with which it may be connected, upon turning the large hand-wheel *M*, the hub of which, revolving in the journal-box *F*, forms a nut, by which the square-threaded screw of a steel plunger is worked. The flow of water is controlled by a screw plug operated by the small hand-wheel *O*, whereby also the pressure exerted upon gases may be suddenly relieved. The water is forced through a small metal tube into the hollow cylinder *a*, which is supported by the tablet *p*, and capable of withstanding a pressure of 900 to 1,000 atmospheres, measured by the

gauges N and N' . a contains the mercury reservoir, into which is plunged the glass tube filled with gas. This part of the arrangement is shown in Fig. 4, which is half size.

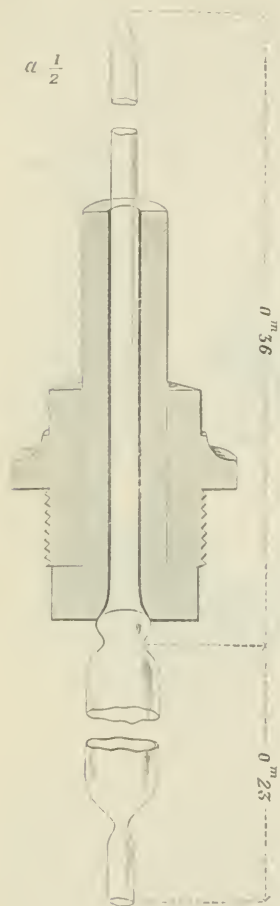


Fig. 4.

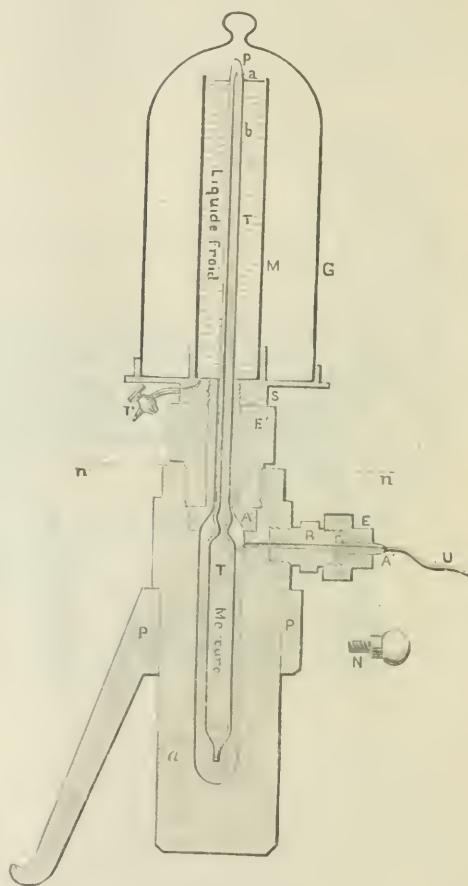


Fig. 5.

Fig. 5 represents the same portion of the apparatus supported on a tripod, P , for use in lecture experiments in connection with any powerful force-pump. E is a hollow nut for connecting the pipe U , and N is a plug for closing the orifice in R when the reservoir a is being filled with mercury. After introducing the open end of the gas tube, T , into the mercury the other parts of the apparatus are placed in position, as

shown. The upper end of *T* is surrounded by the glass cylinder *M*, containing liquid nitrous oxide or other freezing mixture, and covered by the bell-glass *G*, which contains material for absorbing the moisture which would otherwise collect upon *M* and obstruct observation. The liquid freezing mixture may be withdrawn through the stop-cock *r*.

The water entering through *U* presses upon the mercury, forcing it into *T*, and compressing the gas, which is finally liquefied between *b* and *p*. The apparatus is easily managed, and with it and the aid of the oxy-hydrogen light, all the phenomena of the liquefaction of gases can be projected on the screen.

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 25th, 1878.

The annual meeting of the Philadelphia College of Pharmacy was held this day, at the hall, No. 145 North Tenth street, Dillwyn Parrish, President, in the chair. Nineteen members were in attendance and signed the register.

The minutes of the meeting in December last were read and, on motion, adopted. The minutes of the Board of Trustees were also read by the Secretary of the board, and, on motion, adopted.

The by-law defining the duties of the Actuary, which was proposed at the last meeting of the College, and referred to this meeting, came up for consideration. After some discussion it was amended and, on motion, adopted as follows:

CHAPTER VII.

The Actuary shall be elected by the Board of Trustees, and shall be in attendance at the hall of the College, which shall be kept open, under his care, from the hours of 3 to 5 P. M., and 6 to 10 P. M., during the continuance of the lectures; and for the remainder of the year from 3 to 6 P. M. (Saturdays excepted).

He shall also discharge the duties of the Librarian, of the Curator, and of the Registrar of the Pharmaceutical Meetings, under their advice and direction.

This addition would necessitate the following changes: Present Chapter VII to be Chapter VIII, Chapter VIII to be Chapter IX, Chapter IX to be Chapter X, Chapter X to be Chapter XI, Chapter XI to be Chapter XII, Chapter XII to be Chapter XIII, Chapter XIII to be Chapter XIV, Chapter XIV to be Chapter XV.

Mr. Wiegand, Librarian, read the following, which was, on motion, accepted:

The Librarian respectfully reports that during the past year he has bound the theses for the year 1877 and that there has been added to the library 304 volumes—210 presented, 30 by exchange, 64 by purchase.

There has been expended, by order of the Board of Trustees, on account of books purchased, \$76.44; for binding of books (202 volumes), \$80.25.

During the past year the "Répertoire de Pharmacie" has been completed, except the 29th volume; also the "Chemical News" and "Chemist and Druggist," "American Naturalist" and "Popular Science Monthly," "Watts' Dictionary of Chemistry," "Silliman's Journal of Science and Arts," "Journal of Franklin Institute," "Archiv der Pharmacie," "Proceedings of American Pharmaceutical Association," "Sanitarian"—all being serials of general interest to our members.

Any of the members who may have any of the following editions of U. S. Dispensatory, namely, 1st, 3d, 6th, 9th, 11th, which they be willing to dispose of, would confer a favor by sending them to the Librarian.

J. P. Remington, Curator, read a report of the condition of the cabinet, as follows, which was accepted:

PHILADELPHIA, 3d mo. 25th, 1875.

The Curator would report that, owing to the prospect of a gift of new cases for the accommodation of the Centennial specimens, the labor of relabeling and arranging has not yet been commenced.

Many specimens have been presented at the Pharmaceutical Meetings through members of the College, students, etc., and it is believed that time will be had during the coming months to resume work upon the labeling and rearrangement. The action of the College in appointing an Actuary, part of whose duties shall be those of the Curator, will no doubt result in an improvement to the interest of the cabinet.

Respectfully submitted,

JOS. P. REMINGTON.

The report of the Publication Committee was then read by Henry N. Rittenhouse, on behalf of the committee. It was approved and is as follows:

PHILADELPHIA, March 25th, 1878.

To the Philadelphia College of Pharmacy:

GENTLEMEN—We have the pleasure to report to you the operations of the Publishing Committee of the College for the year just closed. Considering the very discouraging condition of mercantile and financial affairs which now and for some time past have continued in this country, the committee are well satisfied with the result of the year's business, which will be seen by a reference to the reports of the Treasurer, Editor and Business Editor.

We would suggest to the members that more advertisements of a suitable character are desired, and we think will repay those who use the pages of the "Journal" for this purpose. The charges will be found reasonable for the service rendered.

We would urge upon the members of the College who are engaged in laboratory work, to contribute to the "Journal" such observations as they may deem of general interest. This is particularly desirable for the next year, during which time the Pharmacopæia will be in review by different committees appointed for that purpose.

HENRY N. RITTENHOUSE, *Chairman.*

The report of the Treasurer of the committee was read by Mr. Bullock. It exhibits the usual favorable condition of that department of the College, and merits the approval of all the members.

The Editor's report to the Publishing Committee was then read, and, on motion, accepted. It gives a very interesting account of the Editor's labors.

The Editor respectfully reports, that the "Journal" has been regularly issued during the past year on the first of each month. The original papers contributed to the "Journal," it is believed, have been of such a character as to sustain its scientific, and, at the same time, practical character, both at home and abroad, as may be judged from the transferring of many of its original articles to the columns of other journals; and likewise, from the fact that four citizens of foreign countries, three of whom are connected with the College by corresponding or honorary membership, have contributed five papers. The amount of this original matter has been so great, as to render it necessary to increase the size of two numbers from forty-eight to sixty-four pages, while, at the same time, most of the essays appearing in foreign journals had to be made accessible to the readers in a materially condensed form.

For the year ending with the March number, 1878, the original papers, exclusive of editorials, gleanings and original translations, reached the number of one hundred and six, being only five less than in the preceding year, in which probably the largest number of original essays had been published. Sixteen of these papers contained longer or briefer abstracts of theses, representing altogether twenty-six of the latter, of which fifteen related to strictly pharmaceutical subjects, one to chemistry, nine to materia medica and one to a subject of general interest. The direct contributions to the "Journal," similarly classed, embrace forty-five papers on pharmacy, twenty on chemistry, twelve on materia medica, and thirteen on subjects of general interest.

The contributors during the past year were sixty-three in number, which is an increase over the years up to March, 1875, but a falling off as compared with the reports in 1876 and 1877, when respectively seventy-two and seventy-seven authors had contributed. The smaller number of authors was, however, compensated for by an increased number of papers furnished by some. While forty-six papers were credited to the same number of authors, we have had seven contributors furnishing two papers each, three with three papers each, six with four papers each and one contributing thirteen papers.

During each of the last three years sixteen members of the College have written for the "Journal," while their contributions have increased from twenty-seven in 1876 to thirty-five in 1877, and forty-one during the year just closed, without counting those of the corresponding and honorary members.

Four of the published papers had been read before pharmaceutical associations in other cities, and twenty-one at meetings held in this College.

Respectfully submitted,

JOHN M MAISCH, *Editor.*

The chairman of the Sinking Fund Committee furnished a statement of the condition of the fund, which shows that the College is steadily discharging its indebtedness.

A letter from William Evans, tendering his resignation as a member of the College, was read, and, on motion, accepted.

Prof. Maisch stated that a number of answers had been received from individuals and associations abroad, stating that the offers of this College to furnish specimens of indigenous drugs would be acceptable, and that they would endeavor to reciprocate such favors as far as practicable, by exchanges of such drugs as were indigenous to their localities.

Mr. Bullock moved that a committee of five be appointed to consider the propriety of changing the mode of electing the Board of Trustees; the committee to perfect a plan and report to the next meeting of the College.

The motion, after discussion, was adopted, and the following gentlemen were appointed the committee, viz.: Chas. Bullock, Ambrose Smith, Thos. S. Wiegand, Daniel S. Jones, Robert Shoemaker.

This being the Annual Meeting, an election was ordered. The President appointed Samuel S. Bunting and Edward C. Jones tellers, who reported the following officers, trustees and committees elected:

President—Dillwyn Parrish.

First Vice President—C. Bullock.

Second Vice President—Robert Shoemaker.

Treasurer—Samuel S. Bunting.

Recording Secretary—William J. Jenks.

Corresponding Secretary—Alfred B. Taylor.

Board of Trustees—Robert Bridges, M. D., John M. Maisch, Daniel S. Jones, Thomas S. Wiegand, James T. Shinn, T. Morris Perot, William B. Webb, Joseph P. Remington.

Publication Committee—John M. Maisch, H. N. Rittenhouse, Thomas S. Wiegand, James T. Shinn, Charles Bullock.

Sinking Fund Committee—Thomas S. Wiegand, T. Morris Perot, James T. Shinn.

Editor—John M. Maisch.

Librarian—Thomas S. Wiegand.

Curator—Joseph P. Remington.

Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, March 19th, 1878.

The meeting was called to order by Dillwyn Parrish, President; the minutes of the last meeting having been read, they were approved.

Prof. Maisch, on behalf of Dr. F. V. Greene, U. S. N., presented a specimen of the fruit of the Jurubeba, *Solanum paniculatum*, preserved in alcohol, which resembles the fruit of the potato, and an examination of which was published in "Amer. Jour. Phar.," 1877, page 506; also a section of the wood of a species of *Bauhinia*, from Brazil, peculiarly variegated with dark veins, susceptible of high polish and evidently well adapted for cabinet makers' use.

Mr. Debrunner, of Pittsburg, sent specimens of cast steel containing 99 per cent. of pure iron; also drillings and filings, obtained without the use of oil, from the same metal, and a sample of Saxony manganese containing 93 per cent. of manganic dioxide.

A specimen bottle of a kind intended to be employed for poisonous liquids was exhibited; the bottle was shaped like an ordinary Seltzer bottle, but upon one side was cast a death's head and cross-bones, with the word poison—a most hideous looking affair—the objection to these bottles, which have raised figures on them, is the great liability to breakage; the prominences being very apt to be broken through. The whole subject of employing particular styles of bottles for poisons was debated for a short time, Prof. Maisch referring to the danger arising from the fact that those who had become used to having all poisonous substances dispensed in a peculiar style of bottle, would conclude that those articles in other kinds of bottles were innocuous.

A sample of the fruit of the Japan persimmon, a species of *Diospyros*, was presented; a member stated that the tree had been acclimated in this country.

Prof. Remington read a paper upon an apparatus for "porousing" plasters, as it is termed (see page 171); such an apparatus he thought desirable, as the plasters of this kind, put upon the market by some wholesale manufacturers, were not reliable, some of the makers admitting that they made two articles of the same name, one which did not contain a trace of the drug after which it was called; the apparatus was exhibited and explained, and the paper referred to the publication committee.

One of the members present asked what was meant by *un-vitrified salts*; he believed it was used for battery purposes; the expression would properly mean salts which had not undergone igneous fusion; no one present was acquainted with the term as applied to any special article.

Prof. Maisch exhibited samples of *coniferin* and artificial *vanillin*; the former a product from the juices of the cone-bearing trees, the latter a derivative of it, has a very decided odor of Mexican vanilla, free from that admixture of tonka odor which was noticed in the vanillin exhibited at the Centennial Exposition; it is made in Germany by a patented process, and, although quite expensive, so great is its strength that it is claimed to be much cheaper as a flavoring agent than vanilla itself.

Mr. Boring inquired whether there was a formula for *tincture of protochloride of*

iron published anywhere. Prof. Maisch stated such a tincture might be readily made, but was neither officinal in the French or German Pharmacopœia, the latter directing an aqueous solution of spec. grav. 1.23; ferrous chloride was rather less freely soluble in alcohol than ferric chloride.¹

A formula for *Cremer's Pomade* was asked for; the preparation was referred to in "Braithwaite's Retrospect," Jan., 1878, p. 198, as an application to the eye, but without giving the formula, which could also not be found in a number of works that were consulted.

A member called the attention of the meeting to a statement in some of the daily papers relative to a new industry which has been lately developed in Pottsville, Pa., that of distilling the oils of *Gaultheria* and several other native plants, the children gathering the crude drugs and bringing them to those who have commenced the distillation of the oils.

In answer to an inquiry for the formula for nigrosine ink, it was stated that two formulæ were published in "Amer. Jour. Phar.," 1875, p. 88, and 1876, p. 54; it seems to possess the advantage that it penetrates the texture of the paper, and a label that has been written with it, when pasted, does not become smeared by the necessary handling when being rubbed smooth upon the bottle. This ink seems to be more permanent than other anilin inks, which usually fade on exposure. Eosin (a very brilliant scarlet) ink is also made from an anilin color, the name, however, is improperly applied, the word meaning merely rosy-colored, not scarlet. Some remarks were made about writing inks which would not be removed by either acids or alkalies, and it was stated that the object could be attained by adding to a nut-gall ink some solution of indigo, or a solution of soluble Prussian blue; the latter compound is obtained by precipitating a ferric salt with an excess of ferrocyanide of potassium, decanting the mother liquor, and washing the precipitate with water until it becomes soluble therein.

Prof. Maisch exhibited a specimen of Java cinnamon, it resembled the variety that came in the market some years ago as Chinese cassia, but was a much thinner bark, and appears to be obtained from *Cinnamomum Zeylanicum*, grown in Java, and not deprived of its suberous layer.

Adjourned.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The general examination was conducted in the same manner as in the preceding year, one afternoon being devoted to each branch and written answers required to the following questions:

QUESTIONS ON CHEMISTRY.

1. What sulphates of the heavy metals (Sp. Gr. over 6) are officinal in the U. S. P.? Give the method of preparation of each and explain the reactions which take place,

¹Hager directs the tincture to be made by mixing 8 parts, each of alcohol and solution of ferrous chloride, and adding 1 part of simple syrup.—EDITOR.

together with the formulæ expressing these changes. State the physical and chemical characters which are distinctive of each salt.

2. What is the source of the Carbonates of Potassium? State the different commercial and officinal forms, the methods by which they are produced, and the impurities which may be present in any variety.

3. What is the mode by which "Sodii Phosphas," U. S. P., is prepared? Give its composition, its physical and chemical characters, and the change produced in it by an elevated temperature.

4. What preparations of silver are officinal? State the methods by which they are prepared and explain, both by words and formulæ, the chemical changes which take place during their production. Which of its compounds is most liable to adulteration, and how can this be detected?

5. What is the officinal process for preparing Iodide of Potassium? Explain the process and give formulæ for the reactions which take place.

6. State the three principal modifications of Phosphoric Acid. Give of each its characteristic chemical name and composition. By what tests may they be distinguished from each other?

7. What is "Hydrargyri Oxidum Flavum," U. S. P., and what is the method by which it is prepared? Why does it differ in color from "Hydrargyri Oxidum Rubrum," and by what means can this latter be made to resemble it in appearance?

8. What are the antidotes for "Arsenic"? State the best form and condition in which they can be used.

9. What are the physical characters and chemical tests by which ferrous and ferric Salts are distinguished from each other?

10. What are the antidotes for the Mineral Acids and for the Alkalies? State their mode of action.

QUESTIONS IN MATERIA MEDICA AND BOTANY.

1. Which plants yield the *liquorice root* of commerce? To which natural order do they belong, and where are they indigenous? Describe the principal varieties of the root, pointing out the essential differences between them, and give the name and nature of their sweet principle.

2. What is *ginger*? Give the name, natural order and habitat of the plant yielding it; describe its physical and structural characteristics, pointing out the differences, with their causes, of the principal commercial varieties, and name its medicinal properties and important constituents.

3. What is *slippery elm bark*? Name the plant, its natural order and habitat. Describe the physical and structural peculiarities of the drug; give its medicinal properties and main constituents, and state in what respects it differs from other elm barks.

4. What is *Iceland Moss*? Give the name, natural order and habitat of the plant; describe the drug; name its medicinal properties and important constituents, and state how it may be deprived of its bitter taste.

5. Name the plants yielding the officinal *flowers of the compositæ*, and give the characteristics of these drugs, their constituents and medical properties.

6. What *fruits of the Piperacæ* are officinal? Name the plants and their habitat yielding them; state at what period they are collected; describe them briefly; enumerate their proximate principles and state to which their medicinal properties are due.

7. Give the name, natural order and habitat of the plant yielding *flaxseed*; describe briefly the physical and structural characteristics of the seed, its important proximate principles, their amount and location in the tissues.

8. Describe the general character of *starch*, its composition and its behavior to solvents and to chemical agents. How may *arroz root* be distinguished from other starches?

9. Define *volatile oils* as to character, origin, preparation, classification and physical properties. Name the principal adulterations, with methods for detecting them.

10. Give the characteristics of the natural order of *Labiata*, and name the medicinal herbs belonging to it.

QUESTIONS IN THEORETICAL AND PRACTICAL PHARMACY.

1. A bottle holds 4,860 centigrams of a liquid having the specific gravity .750. How many troyounces, drachms, scruples and grains respectively of official Aqua, Spiritus Ætheris Nitrosi, Liquor Hydrargyri Nitratis would it contain at the same temperature?

2. Define, illustrate and explain the objects of the following classes of official preparations—Chartæ, Glycerita, Linimenta, Resinæ, Trochisci

3. Give the synonyms and brief outlines of processes for Phenyllic, Amylic, Ethylic, Methylic and Propenyl Alcohols; also, for Valerianic, Salicylic, Benzoic, Gallic and Hydrocyanic Acids.

4. Pyroxylon—How is it prepared? What official preparations contain it, and how are they made? What is its chemical name, uses and properties?

5. Name the ingredients used in preparing Oleum Æthereum, Ammonii Iodidum, Atropiæ Sulphas, and describe the appearance of the finished products.

6. Describe briefly the processes for preparing the following, giving the ingredients in each: Acetum Scillæ, Infusum Gentianæ Compositum, Mistura Cretæ, Spiritus Juniperi Compositus, Pilulæ Antimonii Compositæ, Syrupus Sarsaparillæ Compositus, Tinctura Rhei, Trochisci Glycyrrhizæ et Opii, Unguentum Cantharidis, Vinum Rhei.

7. State the proportions and doses of the official preparations of Opium.

8. Give the ingredients used in five solid and three liquid preparations of Aloes, of the U. S. Pharmacopœia. What are the active principles of the different varieties of the drug, and how may they be distinguished from each other?

9. Write out a description of the physical properties of Sulphate of Quinia, giving its solubilities and tests for identity, purity—including Liebig's, Herapath's, Stoddart's.

10. Describe the physical appearance and characteristics, and give the tests for the active principles obtained from the following: Stramonium Seed, Monkshood, Hemlock Fruit, and give the process for the strongest official preparation of each.

QUESTIONS BY THE EXAMINING COMMITTEE.

1. Define briefly, or illustrate, the following terms: Symbol, Element, Atom, Molecule, Atomic Volume, Molecular Volume, Quantivalence, Formula, Equation, Acid.

2. What is the chemical composition of Æther, and how is it prepared? Give its specific gravity; and name an official preparation into which it enters. What is the official name of the purified product? Give three official preparations which contain it.

3. Sulphuric Acid—state its official name and specific gravity; describe the process of its manufacture; name two official preparations which contain it in a free state. What antidote should be administered in case of poisoning with this Acid?

4. What is nutmeg? Give its official name; also, the locality and natural order of the plant which produces it. What other official drug is obtained from the same source? Give its official definition and describe its appearance. Upon what principles contained in these products do their virtues depend?

5. Give the botanical name, habitat and natural order of the plant yielding Opium. What is the common name of the fruit which furnishes it? Describe the process for obtaining it, and give its dose; name four alkaloids contained in it.

6. Give the official name and definition of Senna, its habitat, medicinal property and dose; name four official preparations into which it enters. Give the commercial names of the two chief varieties, and the botanical name of the leaf which is usually found mixed with one of these varieties.

7. State the formula for preparing Donovan's Solution. Give its official name, color and dose. What change takes place on standing? What causes this change, and how would you remedy it?

8. Give the official title, mode of preparation, and the ingredients used in the following: *Neutral Mixture*, *Soap Liniment*, *Blistering Cerate*, *Spirit of Mindererus*, *Collodion*.

9. Give the ingredients used and describe the process for making *Pilula Ferri Carbonatis*, *Confectio Sennæ*, *Syrupus Pruni Virginianæ*, *Extractum Ergotæ Fluidum*, *Acidum Tannicum*.

10. Would you dispense this? Give your reasons.

A.

R—Tinct. Ferri Chloridi, . . . f ̄ i.
Spirit. Ammon. Aromat., . . . f ̄ i.
Misce.

Sig:—Twenty drops to be taken three times a day.

C.

Can this be safely dispensed?

R—Acid. Arsenios. Cryst., . . . gr. iii.
Pulv. Opii, . . . gr. v.
Mix and divide into 30 pills.

Sig: One pill to be taken morning and evening.

The specimens for recognition were as follows:

CHEMISTRY.	MATERIA MEDICA.	PHARMACY.	EXAMINING COMMITTEE.
Acid. nitro-muriaticum.	Senega.	Alcohol.	Acid. aceticum.
Potassii bicarbonas.	Filix Mas.	Æther.	Acid. gallicum.
Potassii chloras.	Geranium.	Tinct. nucis vom.	Podophyllum.
Sodii carbonas.	Cascarilla.	Vinum Ergotæ.	Cimicifuga.
Liqu. sodæ chlorinatæ.	Stramonii Fol.	Infus. Rosæ comp.	Lycopodium.
Ammonii chlorid purif.	Hedecoma.	Syrup. Ipecacuanhæ.	Kesha.
Ferri subcarbonas.	Rhus glabra.	Confectio Sumæ.	Cerat. Cambaridis.
Plumbi oxidum.	Coriandrum.	Ung. Stramonii	Syrupus Scillæ.
Plumbi acetat.	Myrrha.	Pulv. Rhei comp.	Tinct. Opii camphor.
Acidum oxalicum.	Cantharis.	Morphiæ Sulphas.	Extr. Buchu fluid.

In the practical examination the candidates were required to put up the following prescriptions:

R Extract: Opii, . . . gr. vi.
Ol: Theobromæ, . . . q. s.
Make 6 suppositories, 15 grs. each.

R Olei Ricini, . . . f ̄ iss.
Pulv: Acaciæ, . . . ̄ iii.
Pulv: Sacchari, . . . ̄ i.
Tinct: Opii, . . . f ̄ i.
Aquæ q. s. ut fiant . . . f ̄ iv.
Make an emulsion.

B.
State the mode of preparing this.
Would you dispense it?

R—Olei Tiglii, . . . f ̄ ii.
Tinct. Opii, . . . f ̄ i.
Pulv. Acaciæ,
Sacchari, . . . ̄ i.
Aquæ Menth. Virid., . . . f ̄ ii.

Sig:—A tablespoonful to be taken every hour till it operates.

D.

How would you prepare and dispense the following Gargle? Would it keep well?

R—Potass. Chlorat, . . . i.
Tinc. Ferri Chloridi, . . . f ̄ ss.
Muc. Acaciæ, . . . f ̄ ii.
Syr. Zingib., . . . f ̄ i.
Aquæ, . . . f ̄ iss.

Sig:—To be used as directed.

R Cinchonidiæ Sulph: . . . gr. xxxvi.
Acid: Tartaric: . . . gr. x.
Glycerin: . . . q. s.
Make 12 pills.

R Zinci Oxidi, . . . gr. lxxx.
Ung: Benzoini q. s. ad . . . ̄ i.
Make an ointment.

The following candidates passed the examination, and were recommended for the Degree of Graduate in Pharmacy :

- DAVID PATRICK MILLER, Virginia, *Tobacco Cultivation in Virginia.*
 WILLIAM REYNOLDS KEENEY, Pennsylvania, *Extemporaneous Pill-Coating.*
 CHARLES HERMAN GARDNER, Pennsylvania, *Borate of Bismuth.*
 ERNEST CHARLES FEDERER, Ohio, *Powdered Calisaya of Commerce.*
 FRANK ROOP SMITH, Delaware, *Carya Tomentosa.*
 CHARLES EDWIN BARTON, Ohio, *Dialyzed Iron.*
 CHARLES EDWIN BUTTON, Missouri, *Syrups, by Cold Percolation.*
 WILFORD OLDHAM HIGGATE, Pennsylvania, *Extractum Pruni Virginianæ Fluidum.*
 DELBERT ELWYN PRALL, Michigan, *Infusum Digitalis.*
 LAWRENCE MINOR BULLOCK, New Jersey, *Bark of Castanea Vesca.*
 ERNEST WILLIAM REINECKE, Pennsylvania, *The Fruit of Citrus Limonum.*
 DAVID WILMOT FAWKES, Delaware, *Grindelia Robusta.*
 WILLIAM SPENCER, Pennsylvania, *Preparations of Subacetate of Lead.*
 FRANCIS XAVIER WOLF, Pennsylvania, *The Pharmacist.*
 CHARLES FOSTER LILLY, Pennsylvania, *Linimentum Saponis.*
 EVAN DAVIS LLOYD, Pennsylvania, *Opium.*
 THOMAS CANBY CRAIG, Pennsylvania, *Analysis of Chambersburg Hydrant Water.*
 JOSEPH VINCENT WINGERT, Pennsylvania, *Iris Versicolor.*
 LOUIS ADOLPH PODOLSKI, Pennsylvania, *Chloral Hydrate.*
 WALLACE GEARY BOBB, Pennsylvania, *Prescriptions.*
 NORMAN ISAAC BRUNNER, Georgia, *Pharmaceutical Legislation.*
 DAVID GEORGE HURLEY, Pennsylvania, *Japan Wax.*
 CORNELIUS EDERSON SPENCELEY, Pennsylvania, *Hepatica Triloba.*
 JOHN WINDHAM HARRISON, West Virginia, *The Necessity for Thorough Pharmaceutical Knowledge.*
 GEORGE WASHINGTON GRAY, Delaware, *Tuber of Exogonium Purga, Ipomœa Jalapa.*
 ELWOOD GOULDY HENDRICKS, Pennsylvania, *Hints on Pharmaceutical Manipulations.*
 FRANK FREMONT TRIMBLE, Ohio, *Cimicifuga Racemosa.*
 JACOB FRANCIS ORSELL, JR., Pennsylvania, *Salicylic Acid and its Congeners.*
 GEORGE WILLIAM SAMPLE, Pennsylvania, *Arsenicum and Acidum Arseniosum.*
 HERMAN LERCHEN, Iowa, *Hydrastis Canadensis.*
 ANDREW ALEXANDER KROEG, South Carolina, *Doubtful Opium.*
 BENJ. CARPENTER WATERMAN, Indiana, *Disinfectants.*
 JACOB SAMUEL BEETEM, Pennsylvania, *Doryphora Decemlineata.*
 WILLIAM HENRY DEPREZ, Indiana, *Extractum Cannabis Indicæ.*
 GEORGE PERRY HILTON, New Jersey, *The Papaver Somniferum, its Products and their Uses.*
 EDWARD PEAT, Ohio, *The Double Formulæ of the U. S. F.*
 HENRY BEDELL CRANE, New Jersey, *Ferrum Dialysatum.*
 THOMAS WINFIELD WILSON, Pennsylvania, *Dispensing of Prescriptions.*
 EDWARD JACOBS NEWCOMER, Virginia, *The Responsibility of Pharmacy.*
 GEORGE WILLIAM DAVY, Pennsylvania, *Murexide.*
 JOHN AIKEN FALCK, Pennsylvania, *Aqua Acidi Carbonici.*
 DAVID FRANKLIN SHULL, Ohio, *Erythroxylon Coca.*
 JOHN FREDERICK MOSSBERG, Sweden, *Emulsions.*
 HERMAN BETZ, Iowa, *Coagulating Power of Pepsin.*
 OTTO WERCKSHAGEN, Pennsylvania, *Syrupus Rhei Aquosus.*
 LORENZO DOW LOPER, New Jersey, *The Progress of Chemistry.*
 JOHN ANTHONY SELINGER, Pennsylvania, *Belladonna and Opium.*
 THOS. TREW BROWN, Maryland, *Faults of the Pharmacopœia.*
 HARRY COX, Pennsylvania, *Tinctura Opii.*

- SAMUEL E. ROBINSON, Pennsylvania, *First Year's Apprenticeship*.
 EDWIN ROSENTHAL, Pennsylvania, *Liquor Potassæ*.
 GEO. WALBRIDGE BROWN, New York, *Saccharated Pepsin*.
 MAHLON KRATZ, Pennsylvania, *The Pharmic Lantern*.
 OMAR HENRY MUSSER, Pennsylvania, *The Law of Equal Molecular Volumes and the Atomic Theory*.
 PAUL JOHN SUESS, Pennsylvania, *Rubus Villosus*.
 JOHN WESLEY LEHMAN, Pennsylvania, *The Use of Glycerin in Fluid Extracts*.
 NORMAN R. DEAN, Pennsylvania, *Suppositories*.
 CHARLES THOMAS CAHOON, Pennsylvania, *Sugar and its Derivatives*.
 CHARLES DARIUS FARWELL, Vermont, *Assay of Commercial Extracts and Resins of Jalap*.
 ANDREW ALLISON WHITE, Pennsylvania, *Tincture of Kino*.
 FRANKLIN PIERCE ALBRIGHT, Pennsylvania, *Phytolacca Decandra*.
 CHARLES FOSSELMAN, Kansas, *Benzin*.
 WILLIAM SCOTT FLEMMING, Pennsylvania, *Ung. Oxidi Zinci*.
 HARRY AUGUSTUS HALL, Illinois, *Chemistry*.
 JACOB STRICKLER, Pennsylvania, *Chimaphila Umbellata*.
 GEORGE WILLIAM WHITEHILL, Pennsylvania, *Sulphur*.
 HENRY NOSS, Connecticut, *Phytolacca Decandra*.
 DANIEL PARKE CUSTIS, Florida, *The Official Products of Apis Mellifica*.
 ALONZO GEORGE MACKENSON, Pennsylvania, *Plasma vs. Adeps in Unguenta*.
 JOHN GEORGE JOHNSON, Minnesota, *Preservation of Drugs*.
 CLAYTON RICKER MYERS, Pennsylvania, *Pharmacy*.
 HOWARD MALCOLM LEVERING, Pennsylvania, *Calamus*.
 EDWIN ROBERT ZIEBACH, Pennsylvania, *Hydrargyrum cum Saccharo Lactis*.
 GEORGE COOPER PORTER, Pennsylvania, *Heat*.
 ISAAC PENROSE JONES, Pennsylvania, *Triosteum Perfoliatum*.
 PETER FREDERICK NEPPACH, Oregon, *Berberis (Mahonia) Nervosa*.
 WM. PERRY PORTERFIELD, West Virginia, *Ozone as a Disinfectant*.
 WALTER KULP LITS, Pennsylvania, *Areca Nut*.
 CHARLES MORRISON, Indiana, *False Pareira Brava*.
 MARSHALL MOSES ANDRE DAVIS, Pennsylvania, *Opium*.
 GEORGE WAGNER MANN, Pennsylvania, *Preservation of Syrupus Scillæ Comp.*
 JOSEPH HALBERT KERNAN, Pennsylvania, *Prescription Department*.
 NEHEMIAH DAVIS, Delaware, *Salicylic Acid*.
 JOHN STEVENSON BARNITZ, Pennsylvania, *Pharmaceutical Uses of Paraffin*.
 JAMES W. HORNER, Canada, *The Science of Chemistry*.
 EDWARD LEE HUDGIN, Illinois, *Melia Azedarach*.
 ALBERT KROUT, Pennsylvania, *Pharmaceutical Uses of Glycerin*.
 JOHN HAYS ALLEN, JR., Pennsylvania, *Systematic Pharmacy*.
 JOHN KNIGHT BENNETT, New Jersey, *Disinfectants*.
 BENJAMIN FRANKLIN BACHE, Pennsylvania, *Duty of Pharmacists*.
 SEYMOUR SNOWDEN BURNS, Pennsylvania, *Fungous Growth*.
 DAVID HAMBLETON ROSS, Pennsylvania, *Oleum Cajuputi*.
 RICHARD CORDELIOR MARLEY, Delaware, *Accuracy, Neatness and Attention*.
 WILLIAM WEIS, Pennsylvania, *Dialyzed Iron*.
 THOMAS JEFFERSON WOODWORTH PHILLIPS, New Jersey, *Pharmacy*.
 MORRIS KEMERER SWEITZER, Pennsylvania, *Fucus Vesiculosus*.
 ISAAC DAVIS, Pennsylvania, *Medicated Syrups*.
 THOMAS CRAIGHEAD, Pennsylvania, *Salicylic Acid*.
 PETER GRAYBILL, Pennsylvania, *Chemical Research*.

On the evening of March 14th the successful candidates assembled at the College building in response to an invitation from the professors and the members of the Board of Trustees. After spending some time in pleasant conversation the com-

pany repaired to the museum, on the ground floor, where an inviting supper was in waiting for them. After justice had been done to the various good things, a number of toasts were proposed and responded to, mostly in a humorous strain, and brief speeches made by members of the class and of the board. The time passed pleasantly and merrily until the late hour admonished the company to disperse.

The Commencement exercises were held on the evening of March 15th. The Academy of Music was crowded on the occasion, and the stage handsomely decorated, a huge pyramid of bouquets attracting general attention. The degrees were conferred by the President of the College, Dillwyn Parrish, and the valedictory address delivered by Professor Maisch. At the close of this, Mr. Wingert, on behalf of the class, presented a handsome analytical balance to Prof. Remington, who expressed his thanks, with some remarks appropriate to the occasion.

The exercises were enlivened by music from the Germania Orchestra, and closed with the distribution of the bouquets, books and other substantial presents, which had been sent upon the stage by the friends of the graduates.

In response to a call issued in the last number of the "American Journal of Pharmacy," a meeting of the members of the Zeta Phi Society of the Philadelphia College of Pharmacy was held to take into consideration the celebration of the Twenty-fifth Anniversary, which will occur a year hence. Members of the various classes from 1854 to 1878 were present, and the proposition was received with general satisfaction. A committee was appointed to issue a circular, and prepare business for the next Meeting, which will be held in the College, on Tuesday evening, April 9th, at 8 o'clock, when a general attendance is requested.

Alumni Association of the Philadelphia College of Pharmacy.—The Fourteenth Annual Meeting was held on the afternoon of March 13th, President Mattison in the chair. Eighteen members present.

On motion, the reading of the minutes of the previous Annual Meeting, the several meetings of the Executive Board and those of the Social Series was dispensed with, and the annual report of the President was then read, approved and ordered to be printed.

A Nominating Committee from eight graduating classes reported for President, Albert P. Brown; Vice Presidents, Wallace Procter, W. E. Krewson; Recording Secretary, W. W. Moorhead; Corresponding Secretary, F. Marion Murray; Treasurer, Edward C. Jones; to fill vacancies in the Executive Board, John C. Martin, R. V. Mattison, who were duly elected.

The Treasurer's report was read, a balance of \$85.52 being shown on the credit side.

The Committee on Social Meetings reported in favor of their continuation.

It was resolved, that in future, the committees should consist of two members each from the Board, from the Association at large and from the Zeta Phi Society.

Mr. James A. Stratton, of Bordentown, N. J., was elected as Orator for the next annual reception.

Communications were received from the Alumni Associations of the Cincinnati, St. Louis and New York Colleges, and ordered to be acknowledged. The meeting then adjourned.

In the evening, a reception was tendered to the graduates at the College by the Alumni Association. After a short address by the President, Dr. A. W. Miller delivered the annual address, and the following prizes were distributed: The Alumni gold medal to D. P. Miller, of Virginia, and certificates to C. E. Button, of Missouri, for proficiency in Chemistry; C. E. Barton, of Ohio, for *Materia Medica*; C. H. Gardner, of Pennsylvania, for Pharmacy, and D. E. Prall, of Michigan, for Pharmaceutical Manipulations; also to David Costelo, of Indiana, for having obtained the highest average in the junior examination. A new feature of this entertainment was the delivery of a valedictory address, on the part of the graduating class. Mr. D. E. Prall, who had been selected for this task, acquitted himself very creditably. The presentation of the Alumni album and remarks by several visitors concluded the exercises.

Massachusetts College of Pharmacy.—At the annual meeting, held Marh 4th, 1878, the following-named gentlemen were elected officers for the ensuing year:

President, Samuel A. D. Sheppard. Vice-Presidents—Thomas L. Jenks, M.D.; William S. Folger. Recording Secretary, D. G. Wilkins. Corresponding Secretary, George F. H. Markoe. Treasurer, Charles I. Eaton. Auditor, James S. Melvin. Trustees—Benj. F. Stacey, I. B. Patten, S. C. Tozzer, Geo. H. Cowdin, Chas. P. Orne, Edgar L. Patch, Edw. S. Kelley. Secretary of the Board of Trustees, Henry Canning.

The College and the School of Pharmacy were reported to be in very satisfactory condition.

New York College of Pharmacy.—At the close of the forty-eighth session, the following candidates passed the examination, and received the degree of Graduate in Pharmacy:

George P. Bagley, New York, *Results of several Percolations made with the object of finding the exact weights of several carefully prepared tinctures.*

A. P. Baxter, New York, *An Examination of Granular Citrate of Magnesia.*

A. C. Behrens, Germany, *Officinal Ginger.*

H. L. F. Behrens, Germany, *Zinc and its Officinal Preparations.*

P. B. Boles, Virginia, *Borate of Sodium and its Uses.*

C. W. Brunner, New York, *The Officinal Labiates of the United States.*

T. R. Burgtorf, Germany, *The Products of Apis mellifica, their Medicinal Properties and Uses, Adulterations and Tests.*

S. E. Dougherty, New York, *Syrups by Cold Percolation.*

M. C. Drescher, Germany, *Iodine and Iodide of Potassium.*

A. A. Edlich, New York, *Arsenic and its Officinal Preparations.*

H. W. Evans, Kentucky, *Crab Orchard Salts.*

Gerson Gans, New York, *Historic Pharmacy.*

W. Glatzmayer, New York, *Pills and Wafers*

G. D. Hayes, New York, *The Morphia Value of Commercial Powdered Opium.*

Theodore Heller, Austria, *Oxide of Ethyl, "Ether."*

Daniel Huber, Jr, New York, *Antimony and its Principal Preparations.*

George Inness, New York, *Hydrobromic Acid (H Br.).*

J. B. Jacobus, New Jersey, *Reading and Compounding of Prescriptions.*

- W. H. Keeler, New Jersey, *Jalap, and the Percentage Strength of Commercial Samples.*
 L. G. Ketchum, New York, *Secundem Artem.*
 C. G. Koehler, New York, *The Natural Order Compositæ.*
 J. B. Kunath, Germany, *Senna.*
 Daniel Leibe, New Jersey, *Arsenic.*
 E. N. Liell, New York, *On the Principal Constituents of Digitalis purpurea.*
 F. W. Luerssen, Germany, *Iodine and its Preparations.*
 Silas McIver, Georgia, *Dialyzed Iron.*
 Joseph McMahon, New York, *Liq. Ferri Chloridi and Ung. Hydrarg. Nitr.*
 John Metzger, Long Island, *The Atomic Theory.*
 R. C. Miot, South Carolina, *Gelsemium sempervirens.*
 Silas H. Moore, Vermont, *Plant Life and its Relations to the Animal Kingdom.*
 A. J. More, Pennsylvania, *Damiana: an Investigation of the Commercial Variety.*
 William H. Muller, Germany, *Volatile Oils: their Composition, Adulterations and Modes for Detecting them*
 Charles Potberg, Pennsylvania, *Benzoinum.*
 C. E. Reynolds, Ohio, *Strychnos Nux Vomica.*
 Richard J. Reynolds, New Jersey, *Elegant New Pharmaceutical Preparations.*
 W. F. Riecker, New York, *Eucalyptus globulus.*
 Edward Roth, New York, *Urine and Some of its Constituents.*
 J. W. Schelpert, Georgia, *Glycerin.*
 L. J. Schlesinger, Virginia, *Sugar from Sugar Cane.*
 W. H. H. Schofield, New York, *Iodine and Potassic Iodide.*
 George Schreyer New York, *Starch.*
 W. A. Smith, New Jersey, *Digitalis purpurea.*
 A. T. Snelling, Virginia, *The Preparation of Fluid Extract of Ipecacuanha and Emetia.*
 A. F. Stevenson, New York, *Jalap and its Resin.*
 Louis Thurn, New York, *Iron and its Official Preparations.*
 A. G. Uber, Illinois, *By-products of Gas industry.*
 R. Vandenhenden, Belgium, *Theory of Nitrification.*
 W. M. Walker, New York, *Pharmaceutical Advancement and the Public.*
 Paul Weber, Germany, *Observations from the Pharmaceutical Laboratory.*
 Louis F. Weismann, New York, *Humulus lupulus and its Official Preparations.*
 John Wimmer, New York, *Detection and Isolation of Arsenic in Organic Matter.*

The Commencement exercises were held in Chickering Hall, on the evening of March 19th. The degrees were conferred by the President, Ewen McIntyre, and the Alumni prizes (consisting of a gold, silver and a bronze medal), were awarded, through Mr B. F. McIntyre, to G. D. Hayes, Silas H. Moore and Daniel Huber, Jr. An address was delivered by Prof. R. W. Raymond, and in behalf of the graduating class by R. Robeson. The class presented to the College a spectro-scope, which was received by Prof. Bedford.

Later in the evening the officers of the College and invited guests assembled socially and had a pleasant reunion. The supper over, a number of toasts were proposed and responded to.

Alumni Association of the College of Pharmacy of the City of New York.—The Annual Meeting was held Thursday evening, March 14th, in the University building.

The following officers were chosen for the ensuing year: President, Starr H.

Ambler; Vice Presidents, B. F. McIntyre, J. L. A. Creuse, B. F. Hays; Treasurer, Theobald Frohwein; Secretary, H. L. Coit; Registrar, L. M. Royce; Delegates to the Twenty-sixth Annual Meeting of the American Pharmaceutical Association, P. W. Bedford, Theo. Frohwein, Starr H. Ambler, B. F. Hays, E. Montanus.

At 10 o'clock, the members and invited guests proceeded to the Sinclair House, and gave a collation in honor of the graduating class of 1878, at which, with toasts and speeches, a few hours were pleasantly spent, B. F. McIntyre, the retiring President, presiding.

Alumni Association of the St. Louis College of Pharmacy.—The third annual meeting was held at the lecture-room of the College on the evening of February 19, President Lindeman in the chair. Present twenty-four members. The minutes of the last annual meeting and of the Executive Board were read and approved. The annual reports of the president, officers and committees were read and acted upon, the Treasurer reporting a balance on hand amounting to \$115.25. The election of officers for the ensuing year resulted as follows: Francis Hemm, President; Henry Strassinger and O. E. Trentler, Vice Presidents; W. C. Bolm, Recording Secretary; R. H. B. Hunstock, Corresponding Secretary; Ad. Pfeiffer, Treasurer; C. A. Bendel, Registrar; H. E. Lindeman, Chas. Geitner and F. F. Reichenbach, members of the Executive Board. The newly-elected president appointed a committee of five to suggest amendments to the Pharmacy Act of St. Louis, which, as it stands at present, was pronounced in the retiring president's address as being very impotent and almost useless.

Pharmaceutical Society of Great Britain.—At the pharmaceutical meeting, held Feb. 6, President John Williams in the chair, Prof. Bentley exhibited some *Chinese opium* and the poppy capsule from which it had been prepared. It appears that in China the capsules are not incised but punctured, and after a day, or a day and a half, the opium is scraped off and put into jars; it seems to be generally quite moist and often of a musty odor. Some specimens of Chinese opium had been found to contain as much as 15 to 17 per cent. of morphia; the specimen, examined by Mr. Thirlby, had yielded 7.75 per cent of morphia and 6.75 per cent of narcotina. Prof. Bentley considers Chinese opium altogether inferior to Smyrna opium.

Prof. Bentley also showed *matura flowers*, which, on a superficial examination, resemble fruits, but are really the corollas of *Bassia latifolia*, a tree common in India, in some parts of which they are used for food. They have a saccharine smell and contain a large quantity of sugar. A spirit may be obtained from them, which, when new, is regarded as injurious, and there appears to be a difficulty in freeing it from its disagreeable qualities; but when it is old it is said to get better. Several tons of the flowers are now coming into the English market to be used in distillation.

Prof. C. H. Wood, of Calcutta, read a paper on the *progress of cinchona cultivation and alkaloid production in Bengal*. The cultivation was commenced in 1861, by Dr. Anderson at the botanical gardens at Calcutta, and in the following year preparations were commenced for establishing a permanent plantation in Sikkim, on

the slopes of the Himalayas. The first patch of 500 cinchonas was planted in 1864, in the valley of Rungbee, 12 miles distant from Darjeeling; at present the total number of cinchona trees is 3,000,000, covering about 1,900 acres. Of the species experimented with *C. Pahudiana* was proved to be comparatively worthless; *C. officinalis* and *Pitayensis* will not thrive under the climatic conditions of Sikkim, and *C. Micrantha* yields a bark rich in cinchonia only; their cultivation has been abandoned. *C. Calisaya* grows under rather limited conditions, is more difficult to propagate and has a tendency to run into varieties which do not furnish bark of equal value. Its cultivation has not made the same progress as that of *C. succirubra*, which has proved a decided success; the tree is hardy, growing well under a sufficiently wide range of conditions, seeds freely, is easily propagated and has little disposition to run into varieties. There are now about 2,500,000 of these trees in cultivation, and if regularly cut at the end of their seventh or eighth year (a corresponding number being at the same time planted out), it is estimated, would yield annually 366,000 lbs. of bark, the yield from each tree varying between 6 oz. and 6 lbs. (exclusive of the rootbark which is richest in alkaloids). The bark crop is taken by coppicing (cutting the tree close to the ground) or by uprooting; the experiments on the most advantageous plan of harvesting are not yet concluded.

The average yield of the plantations contains 4 to 5 per cent. of total alkaloids, the average composition of which is quinia, 16.31, cinchonidia, 30.53, cinchonia, 35.26 and amorphous alkaloid, 17.90 per cent. The mixed alkaloids are obtained by exhausting the bark with dilute hydrochloric acid, precipitating with soda, redissolving in just sufficient dilute acid, filtering from coloring matter and again precipitating; the dried precipitate yields a white powder, acquiring a slight buff tint by keeping; it never agglutinates and is readily soluble in weak acids. It is used under the name of *cinchona febrifuge*, and is not intended as a substitute for quinia but a supplement to it, useful in the fever prevalent among the natives of India. It is now manufactured at the rate of 4,000 lbs. per year, the cost price being one rupee per ounce (1s. 9d).

Dr. De Vrij alluded to the rapidly-growing *Cinch. pubescens*, the bark of which is very rich in quinia, yielding on the first renewal by McIvor's mossaing process 9 per cent. of total alkaloids, furnishing 7.2 per cent. of quinia sulphate. The Quinological Congress, held last April in Amsterdam, had decided that that process was the future of cinchona cultivation. In his experience coppicing always yielded a poorer bark than that produced by renewal. He criticised a statement by Surgeon-General Smith in regard to the insolubility of the mixed alkaloids in dilute muriatic acid, proposed for this cinchona febrifuge the name of *quinetum*, and referred to experiments made by Prof. Binz of Bonn, according to which the amorphous alkaloid is much more toxic than quinia.

Messrs. Moss and Wood objected to the word "quinetum," which meant a collection of cinchona trees rather than of its alkaloids.

Dr. Paul referred to the difference in composition which the cinchona febrifuge must necessarily have, and said that whatever might be the advantage of using up the bark in the preparation of that substance, it was still a question whether it would

be possible for the latter to stand against the preparations of the pure alkaloids as offered in the market.

Mr. Wood stated that the process of mossing had failed in Bengal, the new bark being destroyed by ants and other insects; the economy of the process should likewise be taken into consideration. The bark produced at Darjeeling was valuable and very cheap, and, from the observations made, it could be claimed that in a little time Bengal would be able to produce barks equal to the *Cinch. pubescens*.

Paris Pharmaceutical Society.—At the session, held January 9, Mr. Méhu presiding, Messrs. Schaeuffele, Lefort, Desnoix, Marais, Duquesnel and Petit were appointed a permanent committee, for the purpose of examining all propositions concerning new medicaments or new formulas, and reporting the results to the Society.

Mr. Stan. Martin presented a specimen of *Cremocarpus scigerus* of California. It belongs to the Euphorbiaceæ, resembles a croton, and, with water, yields a distillate having a goat-like odor; sulphide of carbon takes up a brown fat, having the same odor, and alcohol a hygroscopic extractive of an acrid and very irritating taste.

Mr. Petit presented *acid bromhydrates of quinia* and *quinidia*, which consist of 4 equiv. of water, 2 of acid and one of base. He also reported on commercial neutral *sulphate of quinidia*, of which he had examined a sample from London and one from Val-de-Grâce; both showed the same rotatory power, and lost at 100°C. not over 0.5 per cent. of moisture; the salt seems, therefore, not to contain any water of crystallization.

EDITORIAL DEPARTMENT.

Synonyms.—On p. 143 of our last number, we referred to a "curious synonym for quinia." In a communication to the "Medical and Surgical Reporter," March 16, Dr. I. Gilbert Young quotes our editorial remarks, with the (undoubtedly accidental) addition of the word *was* in the sentence: "The patient (*was*) imagined to be unable, etc.," thereby changing its meaning. But what we particularly desire to call attention to are the following remarks in Dr. Young's communication:

From my earliest professional days, however, I have (as doubtless most practitioners likewise), encountered a deep, constantly met with, and causeless prejudice to the use of the preparation of Peruvian bark in question. With the view, then, of nullifying, as far as possible, the annoyance resulting from such prejudice, I early adopted, as a synonym for quinia, the caption of this article, "*Sulphas Americana Australis*," and by having it understood by the druggists of my neighborhood, have not only succeeded in puzzling such of my patients as insist on reading my prescriptions, but have also secured to them the beneficent results accruing from the taking of this most valuable "South American Sulphate." Whether the general adoption of some such synonym is expedient or necessary at present is respectfully submitted. Of one fact, however, the writer is certain; it has done good service in many cases, for him.

Most pharmacists, undoubtedly, have been as much annoyed, as most physicians have been, by the refusal of patients to have prescriptions put up on finding them to contain an article which, for some reason or other, they were reluctant to take. In such cases well recognized synonyms become of importance. In our opinion too

little attention has been paid thereto by both physicians and pharmacists, and the subject has been completely neglected by the Pharmacopœia, while several foreign Pharmacopœias give to some old names the official sanction as synonyms, thus: Pharm. Germ. recognizes Opium also as *Meconium* and *Laudanum*; *Tinctura Opii* as *Tinct. thebaica* and *Tinct. Meconii*, etc. It would not be necessary to unearth all the ancient names, but the recognition of one or two synonyms for the most important articles with which the difficulties alluded to have been experienced (quinia is one of these) would prevent that annoyance altogether.

The Western Druggists' Mutual Benefit Association, is the title of an Association, which was incorporated in the State of Ohio about eight months ago. From the charter and by-laws before us, we learn that its objects are the insurance of the lives of its members for the benefit of their heirs. Persons engaged in dealing or manufacturing articles pertaining to the drug trade are eligible to membership, and pay an entrance fee, graduated according to their age. \$1.25 assessment is paid in anticipation of a death. All funds are securely invested, and, on the death of a member, his heirs receive a sum equal to one dollar for each member, but not exceeding \$5,000. The balance is used for defraying the necessary expenses, the only salaried officer being the Secretary, and the surplus is allowed to accumulate until it exceeds by \$3,000 the amount of a death loss, when the latter will be paid from the Treasury in place of making an assessment.

The present Trustees are members of prominent firms of Cincinnati, and as to the plan, that appears to speak for itself, combining economy of management with all the advantages that may be expected to accrue from a mutual benefit organization.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Jahresbericht über die Fortschritte der Pharmacognosie, Pharmacie und Toxicologie. Herausgegeben von Dr. Dragendorff, Professor der Pharmacie in Dorpat. Neue Folge. 11. Jahrgang, 1876. Göttingen, Vandenhoeck & Ruprecht's Verlag, 1877. 8vo, pp. 682.

Annual Report on the Progress of Pharmacognosy, Pharmacy and Toxicology. For the year 1876.

The general arrangement of this annual remains as in former years; it opens with an enumeration of the pharmaceutical literature, giving the titles of books and pamphlets and new journals relating to pharmacy and allied branches, and a brief review of a number of them. In the second division those essays are considered which refer to general pharmacy and to the condition of pharmacy in different countries. The third division embraces pharmacognosy, and is subdivided in drugs from the vegetable and animal kingdom. Pharmaceutical chemistry is the subject of the fourth and pharmaceutical preparations of the fifth division, the latter with an appendix giving the composition of those nostrums the analysis of which was published

in 1876. The publications on toxicology and forensic medicine have been reported on in the sixth division.

The former reports of this work are so favorably known that it is unnecessary to enlarge upon the merits of the volume before us. The abstracts have, as usual, been made with great care; sufficient details are given to enable the reader to work by or identify the bodies treated of, references being frequently made to reports of former years or to other papers published in the same volume, the consultation of which is very much facilitated by the thorough systematic arrangement. Papers which are not suited for abstracts are enumerated, with the source where published, and a general statement of their contents. A good index of authors as well as of subjects likewise renders the report very serviceable.

A Handbook of Volumetric Analysis; designed for the use of Classes in Colleges and Technical Schools. By Edward Hart, S. B., Fellow of Chemistry in the John Hopkins University. New York: John Wiley & Sons, 1870. 12mo, pp. 326. Bound. Price, \$2.50

We have been very much pleased in finding this work so well adapted for the use of the student and at the same time as a book for ready reference. It is divided into three parts, Part I being devoted to the instruments, the sources of error, preparation of the solutions and the general methods of volumetric analysis, namely those of saturation, oxidation, reduction and precipitation.

Part II treats of the estimation of the different metals and the non-metallic elements and their compounds. Some special subjects, such as steel, oxygen in water, urine, water and indigo, have been reserved for Part III, though the last subject is scarcely more than alluded to, no details being given

As far as we have examined it, we have found the descriptions clear and precise, the methods well selected and the illustrations good and characteristic. We have observed little that we would desire to have altered. In some cases, the methods might, perhaps, have been described more in detail, but as they are, they are quite sufficient for those who understand the reactions, and no others should attempt to work by a complicated process. We prefer the term "neutralization," though we know that "saturation" is much more generally employed for the methods depending upon the neutralization of an acid by an alkali, and *vice versa*. On p. 45 it is directed to remove excess of baryta by "Seltzer water"; carbonic acid water, of course, is meant.

Report on Adulteration of Food; being Supplement No. III to the Report of the Department of Inland Revenue. Ottawa: Maclean, Roger & Co., printers, 1878.

This report has been printed by order of the Parliament of the Dominion of Canada. The report itself is brief, giving merely a summary of the results and the proportion of the examined samples adulterated. It shows the value of the law in exposing dishonesty and protecting the consumer, and argues in favor of extending its provisions to the whole Dominion. It is followed by 25 plates, containing 60

figures of microscopic objects illustrating the adulterants used for the adulteration of tobacco and of some articles of food

The appendix contains the various analytical reports more in detail, and arranged in condensed and tabular form.

Taschenbuch der Nahrungs-und Genussmittel-Lehre. Von G. C. Wittstein. Nördlingen: C. H. Beck'sche Buchhandlung: 1878. 12vo, pp. 176.

• Compendium of articles of food and drink.

The author, who is well known to our readers not only as an authority in pharmaceutical matters, but likewise as a man who has ever battled against nostrums and adulterations, states upon the title page that the work was intended to take particular cognizance of the deteriorations, impurities and sophistications to which articles of food and drink are subject. The material has been arranged in alphabetical order, and in each case has been given as nearly as possible, 1, the physical and chemical characteristics of the article; 2, the changes and adulterations thus far observed; 3, the recognition of these with the most simple and, at the same time, reliable means, and 4, hints in regard to the proper vessels and means for preserving these articles. The aim was to produce a work for the use of every housewife of ordinary intelligence; but it is obvious that, occasionally at least, processes had to be described which cannot be performed except by the expert. The book is therefore also valuable to the latter, and since in cases of doubt the pharmacist is not unfrequently applied to for his judgment, and since all the spices and many other articles used in the kitchen or for invalids are legitimate pharmaceutical goods, the work before us is likewise of importance to the pharmacist, giving him, in many instances, advice as to how to proceed for determining the purity of articles of everyday consumption, and as such, we recommend it to our readers.

Gmelin-Kraut's Handbuch der Chemie. Anorganische Chemie in drei Bänden. Sechste Auflage. Heidelberg: Carl Winter's Universitäts Buchhandlung, 1877.
Gmelin-Kraut's Handbook of Chemistry. Inorganic Chemistry, in three volumes.

Before us are parts 7 and 8 of the first division, and parts 3 and 4 of the second division of the second volume of the sixth edition of Gmelin's Chemistry. The former contains the conclusion of calcium and a good portion of magnesium; the latter tungsten and molybdenum. The first and third volumes have been completed, so that only the second volume remains to complete this new edition, and, being divided into two parts, one being prepared by Prof. Kraut, the editor of the whole work, the other by Prof. Jörgensen of Copenhagen, there is a fair prospect that ere long this valuable work will be in the hands of all interested.

Medicinal Plants; being descriptions with original figures of the principal plants employed in medicine, and an account of their properties and uses. By R. Bentley, F.L.S., and H. Trimen, M.B., F.L.S. Philadelphia: Lindsay & Blakiston. 1877. Price per part, \$2.00.

Parts 25 and 26 before us, describe the following plants: *Abrus præcatorius*, *Lin.*

(Indian liquorice); *Alstonia scholaris*, R.Br. (Dita bark); *Arctostaphylos uva ursi*, Spreng.; *Berberis aristata*, DC.; *Capsicum annuum*, Lin.; *Calatropis procera*, R.Br. (Mudar); *Cassia fistula*, Lin.; *Cepitis trifolia*, Salisb.; *Galipea cusparia*, St. Hil.; *Gynocardia odorata*, R. Br. (*Chaulmugra* of India); *Hydrastis canadensis*, Lin.; *Nectandra Rodiæi*, Schomb.; *Solenostema argel*, Hayne, and *Veronica* (*Leptandra Nutt*) *virginica*, Lin.

First Annual Report of the Commissioners of Pharmacy of the State of Maine, 1877.
Augusta: Sprague, Owen and Nash.

This official report gives an account of the proceedings of the board during the first year of its existence, and makes some suggestions for modifications; 1, that a registered pharmacist be forbidden to conduct more than one business by virtue of his certificate; 2, that any person may have an interest in the business, but that it must be conducted by a registered pharmacist; 3, modification of the Maine liquor law so as to permit pharmacists to dispense alcoholic liquids.

Proceedings of the Michigan Pharmaceutical Association at its Fourth Annual Meeting.
Detroit, Oct. 17, 1877, 8vo, pp. 39.

Proceedings of the Sixth and Seventh Annual Meetings of the New Jersey Pharmaceutical Association, held in New Brunswick, May 17, 1876, and Newark, Wednesday May 16, 1877, with an appendix containing the proceedings of a special meeting, held at Long Branch, August 16, 1871, and the proceedings of the Second Annual Meeting, held at Trenton, Feb. 7, 1872. 8vo, pp. 73.

Proceedings of the Ninth Annual Meeting of the California Pharmaceutical Society, and the Fifth Annual Meeting of the California College of Pharmacy, held at San Francisco, Jan. 10, 1873. 8vo, pp. 42.

The publication of these pamphlets gives evidence of the interest felt in the advancement of pharmacy in the three States mentioned.

The reception of the following pamphlets is hereby acknowledged:

What am I? A valedictory address to the graduates of the Medical Department of the University of Louisville, Feb. 28, 1878. By J. M. Bodine, M.D. Pp. 28.

Proceedings of the Association of Medical Officers of American Institutions for Idiotic and Feeble-minded Persons, 1876 and 1877. Philadelphia: J. B. Lippincott & Co. Pp. 35.

Belladonna as a Remedy for Collapse. By Reinhard Weber, M.D.

Report on One Hundred and Ten Cases of Extraction of Cataract by Von Graefè's Peripheric Linear Method. By M. Landesberg, M. D.

The last two reprints from Philadelphia "Medical Times."

Correction.—The cut on page 172 has, through the carelessness of the printer, been placed in a wrong position. The plaster being fastened on a table or counter, the perforating tool is necessarily worked *from above*, and the illustration should be turned so that the plaster is at the bottom.

THE AMERICAN JOURNAL OF PHARMACY.

MAY, 1878.

FLUID EXTRACTS BY REPERCOLATION.

By EDWARD R. SQUIBB, of Brooklyn.

As the time approaches for a revision of the U. S. Pharmacopœia those parts of it which require the most time and labor should be recognized, that due consideration may be given to them ; and there is certainly no department of the work where more time and labor is needed than upon the Fluid Extracts and Extracts. Should the Committee of Final Revision fail to find and adopt the best plan of making this important class of preparations the Pharmacopœia instead of being the model and standard of the Nation will be surely disregarded and left behind by the practice and the results of the large manufacturer and the evil of the present will be confirmed and fastened upon the future.

It will not do for the Committee to disregard any plan because it is laborious, or troublesome, or expensive, or complicated, or because it is not adapted to the knowledge and capacity of the large majority of physicians and pharmacists. These, though very important, are still secondary considerations. The thing to be accomplished in the Pharmacopœia is to have practically perfect preparations in every respect. That is, preparations that are really what they profess to be. They should contain all the active and useful parts of the drug in their natural conditions and associations ;—should reject as far as practicable the inert and useless portions of the drug ; and should bear the established relation to the drug, of minim for grain ;—or, weight for weight, if this can be accomplished without materially disturbing the established relation. To effect this object a general scheme, plan or process can be adopted, and then every drug must be studied carefully and laboriously.

The original process of Prof. Procter accomplished the exhaustion of the drug insufficiently, but that difficulty can be easily remedied by carrying the percolation farther. But the concentration of the weaker

percolate to obtain the established relation between the drug and the fluid extract presents difficulties which are probably insurmountable by that process. It is not simply by the heat and oxidation of the evaporation process that all the harm is done to that portion of the preparation, but the active principles are so dissociated and split up by the concentration that they are no longer in their natural condition, but form new relations and combinations which change their solubilities, and bring a new set of reactions into play, making the preparation something else than what it professes to be. The evidence of this is found in the fact that a resinous or oleaginous drug can be thoroughly exhausted by a menstruum which will permanently hold all its constituents in solution. But if such menstruum be evaporated off, the same menstruum will not dissolve and hold the extract again. Nor will any other menstruum ever again reconstruct the extract or restore it to its original condition. For example a diluted alcohol will exhaust Buchu and will hold the oil, while in its natural relations with other constituents of the leaf, in the same kind of combination or emulsion that exists in the leaf before extraction, and in such a solution, though very dense, the oil does not change in odor much,—if at all more rapidly than the leaf does. But if such a solution be evaporated until the oil is precipitated and shows itself as a fully formed oil, the same strength of alcohol will not redissolve it. Nor will any strength of alcohol redissolve the whole of the extract, or recombine its once separated elements into their natural condition. And moreover, the oil when separated, changes its physical properties more rapidly than when in its natural condition in the leaf, or than when separated with its natural associations unbroken. These circumstances constitute the chief objection to the original process, and to many of the original menstrua of Prof. Procter, and led the present writer to try to make improvements both in the process and the menstrua.

This effort at improvement by the writer was begun in a paper published in the Proceedings of The Amer. Pharm. Asso. for 1865, p. 201. To diminish the proportion of alcohol in the menstrua, and to economize its use, were the principal objects of this paper, and it is cited here for reference in regard to the importance of the points there insisted upon, because these points have not attracted the attention they deserve.

The effort at improvement was continued in 1866 by a paper pub-

lished in the Proceedings of that year, p. 81. In this paper the method by repercolation was first proposed and described as overcoming the principal objections to the previous methods.

This method of repercolation has now been exclusively used by the writer for nearly twelve years in the production of many thousands of pounds of all the principal fluid extracts, and the object of this paper is to sum up this experience, and publish the modifications of the process, as they have been suggested and successfully applied during this prolonged experience, with a view of bringing the process more prominently into notice in order to be critically examined and tested. The general results of the application of repercolation, in the writer's hands, are, that no other process yet proposed accomplishes the main objects so well; and therefore that unless some new process can be devised that may attain the objects better and more accurately than this, it should be the process adopted for the Pharmacopœia.

In 1867 papers by the writer upon this same subject, as applied to the Cinchonas, may be found in The Amer. Journ. of Pharm. for July, August and September, and in the Proceedings of The Amer. Pharm. Asso. for 1867, p. 391. All the principles involved in percolation and repercolation were fully discussed and illustrated in those several papers, but they seemed to attract little attention, and they are cited here to avoid recapitulation, since they cover nearly every point which the writer has now to bring forward. But the papers also contain many details which accumulating experience has improved and materially modified.

About 1870 a new form and arrangement of percolator was devised by the writer, and was put into practice so successfully that two years later in the Proceedings of The Amer. Pharm. Asso. for 1872, p. 182, an account of it, with a cut, were given in detail. This contrivance has now been in use continuously for about 8 years, upon every scale from 4 ounces to about 400 pounds, and by pretty thoroughly carrying out the principles involved in percolation, it has contributed very largely to the success and uniformity of the process in the writer's hands. But the apparent complication of this device, and the details of repercolation, seem to have operated against any general understanding of the process, so that it has probably been generally condemned without sufficient trial; while the physical laws which govern the relations between liquids and solids in the direction of discrimina-

tive solubilities have been still too much overlooked, in favor of the earlier and more simple processes.

Whatever may be said of the older processes in regard to simplicity and facility of application, by which they are adapted to any capacity, and thus go into general use, it may also be said with great certainty that under the ordinary conditions of their general use, they do not accomplish their object to a reasonable extent, or as well as other processes now known: and that although the resulting preparations are put forth in the Pharmacopœia as representing the drugs minim for grain, they do not really come near to this relation. The variations in the quality of the drugs used, and the variations in the moisture which they contain, are elements of so much uncertainty and want of uniformity in the liquid preparations made from them, that it becomes very important to reduce all other sources of variability to a minimum.

Repercolation, well applied, leaves little to be desired in making a liquid preparation that will fully represent the drug in almost any desired relation of strength; and if indifferently applied, the inaccuracies of one operation are so made up and controlled by those which follow that when the results of the different operations or percolations of the process are mixed together the general results must be practically good and uniform.

Indeed, so satisfactory has this process been in the writer's hands for the last 8 or 10 years, that the difficulties of making good fluid extracts have been entirely confined to the getting of good materials to make them from, and in controlling the hygrometric moisture in such materials when used. And in view of the satisfactory results, the inconveniences of the process and the disadvantage of having to carry a large stock of the weak percolate from each drug,—seem now to be of very much less consequence than at first.

Upon finding out how much more serious these inherent objections to repercolation appeared to others than to himself, and how little credit the process obtained for its results in the way of counterbalancing these objections, the writer set himself to the task of trying to simplify the apparatus and the process to the utmost extent that could be done without sacrificing the principles upon which the success depends: so that by doing away with the machinery and apparent complication of a special percolator, and as many details as possible, the process might appear less objectionable beside the older methods, and thus induce

pharmacists to learn it and try it long enough to become expert at it, and to be able to judge wisely in regard to its practicability and its appropriateness to pharmacopœial use.

These efforts at simplification are now to be set forth for whatever they may be worth, and they may be best introduced here by a model process.

For this model process it may be well here, again, to take the most difficult substance known to the fluid extract maker,—namely Cinchona bark. This was one of the substances investigated in the papers of 1867 above referred to, and they may be usefully read as including some points of investigation omitted here,—and especially in regard to testing the alkaloid value of different portions of the percolates.

The Cinchona used in the model processes to be given is of exceptionally good quality, and therefore exceptionally difficult to exhaust. It is a Yellow Cinchona from the *C. officinalis* cultivated in Java, and contains about 9 per cent. of total alkaloids of which about 7 per cent. is quinia. It is therefore more than three times the value of officinal Yellow Cinchona, and when such barks are used for making the fluid extract, this should be reduced to some standard of strength. That is, the Pharmacopœia should direct that its Fluid Extract should have a definite alkaloid strength. In these model processes however this Cinchona is used as if it was of the ordinary quality.

As the preparation of this paper for publication was undertaken by the special request of the Committee on the Pharmacopœia of The Amer. Pharm. Asso. for use in connection with their work of finding out the best way of making fluid extracts, the details of the processes must be given with a minuteness that may seem useless and tedious. Beside, it is a prominent object of the writer to show how, in his judgment, every individual fluid extract must be studied before it is adopted by the Pharmacopœia, if the utility and character of the Pharmacopœia as a standard for the nation is to be restored to it. Who is to do this work, and who is to pay for the time, skill and labor necessary to do it well, are problems for the future.

The first most important question is that of a proper menstruum. The present officinal menstruum having proved objectionable soon after the Pharmacopœia was issued, a menstruum was adopted by the writer containing 109 parts Alcohol, 16 parts water and 41 parts Glycerin. This menstruum has now been in successful use for many years and

affords good exhaustion, and a fluid extract which weighs 7685 grains to the pint. This is almost exactly minim for grain and weight for weight. But as the drug never is quite exhausted even under the very best management the measure never should have been made minim for grain if the drug was to be fairly and fully represented by the fluid extract. As a rule of actual practice, the drug will not often be exhausted within 5 or 10 per cent. and by the officinal management, will fall greatly below this. A more accurate proportion would have been 90 to 95 minims to each 100 grains of drug or about 8000 grains of drug to make a pint of fluid extract each minim of which should represent a grain of the drug. Even by repercolation some such excess is needed to make the therapeutic relation what it professes to be. Beside this objection of being too close in theoretical relation to be true in practical value, this menstruum has long been believed to be unnecessarily strong in alcohol, and containing too much glycerin. The glycerin in many cases has a secondary use in menstrea which is hardly less important than its primary use as a solvent. It has the property of wetting substances, and permeating them to the exclusion of air, to a much greater degree than water or alcohol, and, when mixed with water or alcohol imparts this property to the mixture. When used at all, therefore, it must be used with both these functions in view, and one step beyond this is objectionable. After a preliminary set of percolations with this old menstruum to observe how it would work on the small scale of 4 troy ounces of powder to each percolation, a new menstruum was tried consisting of 2 parts stronger alcohol, 2 parts water and 1 part glycerin, and a preliminary set of percolations upon the same scale of 4 troy ounces gave good results, but proved that the scale was so small as to need especial skill and care in order to attain the desired accuracy.

Another tentative trial was then made with this new menstruum on a scale of 8 avoirdupois ounces at each percolation, and this proved to be a much less troublesome scale. And, for Cinchona it is about as small a scale as can be worked to advantage. An avoirdupois pound would be better and easier still. The details of these trials need not be given, and it is sufficient to say that they indicated, and gave a part of the necessary experience needed for another careful trial, in which two very important points were still to be settled, namely the proportion of menstruum and weak percolate that was best to moisten the powder, and the length of time that was best to macerate each portion, the trials having

shown that great variation was produced by both these elements. It was at first believed that 4 parts of liquid was sufficient to moisten 8 parts of powder, and that 24 hours was long enough to macerate, and the first two percolations of the following series were made with these conditions. In the third percolation the liquid was increased to $5\frac{1}{2}$ parts, and the maceration kept at 24 hours. In the fourth the liquid was increased to 6 parts. In the fifth it was kept at 6 parts, and the time of maceration was extended to 48 hours. In the sixth percolation it was increased to 7 parts, and the moistened powder, covered closely was allowed to stand 8 hours to absorb the liquid more thoroughly. Then the powder was passed through a No. 8 sieve, packed pretty firmly, filled with weak percolate and then macerated for 48 hours, making a total maceration of 56 hours.

The first percolation of the series, made with fresh menstruum throughout, is of course a simple percolation, and was carried to practical exhaustion. And this practical exhaustion was doubtless to within 5 or 10 per cent. of absolute exhaustion of all matters soluble in the menstruum. The residue was quite tasteless for more than half way down the percolator, and then began to be very slightly bitter. This bitterness increased until at the bottom of the percolator it was quite distinctly bitter, after percolation under very favorable circumstances with nearly four times its weight of menstruum.

It is quite certain that the extract obtained from a drug by percolation is not uniform throughout the percolation in its medicinal value. If the menstruum be well adjusted as a solvent of the active principles of the drug it will dissolve and carry out the most soluble portions first and in largest proportion, so that although doubtless some of the useful part continues to be present in all parts of the percolate and its extract, yet the proportion must diminish much more rapidly than the proportion of extract. This point is well shown, so far as Cinchona is concerned in a table given by the writer in the "Amer. Journ. of Pharmacy" for 1867 p. 402, where each portion of percolate and its extract were assayed for the total alkaloids they contained. Hence, though the quantity of dry extract yielded by different portions of the percolate be not a measure of the medicinal value of the percolate it is still the best guide that is easily accessible. Bearing in mind then, that medicinal exhaustion by percolation is more rapid than absolute exhaustion, and that the dry extract which measures absolute

exhaustion becomes poorer in medicinal efficacy and richer in inert extractive matter, and that this divergence in value is greatest near the end of the process, the quantity of dry extract yielded by each fraction of the percolate is adopted as the most convenient measure of the rate and the extent of the exhaustion.

The want of uniformity introduced into this series of percolations by the variation in the quantity of liquid used to moisten the several portions of the powder, and the variation in the time of maceration, diminishes the value of the series as illustrative of the best results of repercolation; and made it advisable to add a fifth and a sixth percolation to show the true character of the process when fairly established in actual practice; and thus these two percolations become by far the most valuable of the series as results of repercolation in actual practice, whilst the formula and process merely show how to begin to use repercolation.

The formula and process now to be given embrace the experience obtained in making the series which it represents, and is offered as a model by which other trials should be made by other hands, with other varieties of Cinchona.

Take of Yellow Cinchona, in powder No. 50,	.	.	32 parts.
Stronger Alcohol, ¹ s. g. '819 at 15.6°C. = 60°F.,			
	or s. g. '811 at 25 °C. = 77°F.,	2 parts.	} For a sufficient quantity of menstruum.
Glycerin,	s. g. 1.250 at 15.6°C. = 60°F.,		
	or s. g. 1.244 at 25 °C. = 77°F.,	1 part.	
Water,	.	2 parts.	

Weigh the Stronger Alcohol, Glycerin and water in succession, in any convenient quantity at a time, into a tared bottle, and mix them thoroughly for a menstruum.

Moisten 8 parts of the Cinchona with 8 parts of the menstruum, by thoroughly mixing them, and allow the mixture to stand 8 hours in a closely covered vessel. Then pass the moist powder through a No. 8 sieve, and pack it firmly in a percolator. Pour menstruum on top until the mass is filled with liquid and a stratum remains on top unabsorbed; cover the percolator closely and macerate for 48 hours. Then arrange

¹ It is hoped that in the next revision of the Pharmacopœia the "Alcohol" (s. g. '835) may be dropped, and the simple name Alcohol be applied to a clean spirit, of about the s. g. here given.

the percolator for an automatic supply of menstruum, and start the percolation at such a rate as to give 1 part of percolate in about 4 hours. Reserve the first 6 parts of percolate and continue the percolation until the Cinchona is exhausted, separating the percolate received after the reserved portion into fractions of about 8 parts each.

Moisten a second portion of 8 parts of the Cinchona with 8 parts of the weak percolate,—the first portion that was obtained next after the reserved percolate,—and allow the moist powder to stand for 8 hours in a vessel closely covered. Then pack it moderately in a percolator, and supply the percolator automatically with the remaining fractions of the weak percolate in the order in which they were received, and finally with fresh menstruum until the Cinchona is exhausted. Percolate in the same manner and at the same rate as with the first portion of Cinchona, and reserving 8 parts of the first percolate, separate the weaker percolate into fractions of about 8 parts each.

Percolate the third and fourth portions of 8 parts each of the Cinchona in the same way as the second portion.

Finally mix the four reserved percolates together to make 30 parts of finished fluid extract; and having corked, labelled and numbered the bottles containing the fractions of weak percolate, set them away until the process for Cinchona is to be resumed.

When this fluid extract is to be again made, repeat the process as with the second portion, and reserve 8 parts of the first percolate as finished fluid extract from each 8 parts of Cinchona from that time forward so long as the fractions of weak percolate are carried forward with which to commence each operation.

In applying this formula and process each part was taken as an avoirdupois ounce, and therefore each percolation was made with a half pound avoirdupois of the Cinchona; and the menstruum was made in a tared bottle from time to time as required.

As before stated, the series was made to consist of 6 percolations and therefore the last 2 are in addition to the 4 of the formula, as if the process had been twice resumed, and the results of these 2 are entitled to most attention as showing the true practical character of the process of repercolation. And every percolation which might follow these can be demonstrated mathematically to approach nearer and nearer to accurate results the farther the series is extended, since

every successive percolation tends to correct the errors and improve the accuracy of those which have preceded it.

For the purposes of this paper as a model, and to construct the following table, the percolate from the first five percolations of this series was divided into much smaller fractions than is directed in the process, or needed in actual practice, leaving for a subsequent table the model for actual practice. The fractions of the first 5 were somewhere near 2 parts or 2 ounces each, = 56.7 grams. It was not easy to get them uniform in weight, and therefore this was not attempted. Each fraction was shaken up and accurately weighed. Then about 1 cubic centimetre was measured off into a tared shallow watch glass, and quickly weighed to avoid loss by evaporation. These weighed portions were then dried by steam heat until they ceased to lose weight and the residue carefully weighed. This gave the data for calculating the total residue which each fraction would give if the whole fraction had been evaporated. But a large proportion of this residue was glycerin, and it was sought to get at the extract only. So a cubic centimetre of the menstruum was weighed and evaporated in the same watch glass until it ceased to lose weight under the same conditions, and it was found that the residue weighed 16 per cent. of the weight of the menstruum. This was an unexpected result, for as the menstruum contained 20 per cent. of its weight of glycerin, it was to be expected that upon evaporation very nearly this proportion would remain on the watch glass. Therefore the trial was three times repeated, and the mean of the trials was within a very small fraction of 16 per cent., showing that about 4 per cent. of the glycerin went off with the alcohol and water. This gave the remaining element for closely approximating the extract in each fraction by the following formulas. As the weight of the cubic centimetre taken from each fraction of percolate is to the weight of the residue after evaporation, so is the weight of the entire fraction to the weight of the residue it would leave on evaporation. But had this fraction been menstruum instead of percolate, and been evaporated under the same conditions, it would have given 16 per cent. of its weight of glycerin as a residue. It was therefore assumed (though of course not correctly) that 16 per cent. of the entire fraction was glycerin. Then 16 per cent. of the weight of each fraction was taken and this amount

was subtracted from the calculated residue of the fraction, and the remainder was assumed as dry extract of cinchona. Next, as these fractions were not uniform in weight, the assumed extract did not represent a uniform proportion and rate of exhaustion. To show this rate of exhaustion better, a second proportion was made to represent it by per centage. As the total weight of the fraction is to the weight of extract obtained from it, so is 100 to the percentage of extract it contained. For example: The first fraction of the table weighed 62.72 grams. One cc. of this fraction weighed 1.062 grams. This, dried on a watch glass, gave a residue weighing .488 gram. Then, As 1.062 : .488 :: 62.72 : 28.82. But this 62.72 grams. is assumed to give 16 per cent. of its weight of glycerin which does not go off by evaporation or (As 100 : 16 :: 62.72 :) 10.04 grams. glycerin : and 28.82 residue less 10.04 glycerin leaves 18.78 as the approximate dry extract contained in the fraction of 62.72 grams. of percolate. Then if 62.72 percolate give 18.78 extract, 100 percolate would give 29.9 extract, equal the percentage of extract contained in the fraction of percolate.

The remaining column of the table gives the difference in specific gravity at similar temperatures, between the menstruum and the various fractions of the percolates, and this also illustrates the rate of exhaustion, but in a way much easier of application in practice than that of weighing the extract.

Repercolation of Cinchona: Menstruum—Stronger Alcohol 2, Water 2, Glycerin 1. S. G., '9728 at 20°C.

	First Percolation.			Second Percolation.			Third Percolation.			Fourth Percolation.			Fifth Percolation.			Sixth Percolation.		
	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.	Grammes.	Weight of Dry Extract.	Difference in Specific Gravity.
1st Portion.....	6.7	16.78 20	1.112	60.51	17.99 28.2	1.160	62.11	20.23 32.4	1.468	62.41	19.50 31.2	1.484	51.30	17.76 34	1.474	51.30	17.76 34	1.474
2d ".....	59.55	10.99 36.3	1.111	55.78	17.99 32.3	1.292	56.24	11.07 25.0	1.180	58.01	15.46 26.4	1.484	63.06	22.57 5.6	1.474	63.06	22.57 5.6	1.474
3d ".....	57.63	13.54 31.5	1.060	60.48	12.53 30.6	1.244	59.20	10.93 18.5	1.068	57.63	11.25 19.5	1.090	61.68	10.32 31.1	1.516	61.68	10.32 31.1	1.516
4th ".....	58.06	11.07 26.4	1.080	58.57	12.76 21.7	1.012	62.40	13.00 20.9	1.094	48.15	8.68 18.0	1.090	51.45	14.16 27.5	1.434	51.45	14.16 27.5	1.434
5th ".....	78.30	14.00 10.6	1.078	57.68	6.69 10.1	1.012	56.30	8.74 15.5	1.076	60.52	10.42 17.0	1.082	64.46	11.50 24.5	1.468	64.46	11.50 24.5	1.468
6th ".....	57.88	6.83 11.8	1.030	50.84	5.97 10.5	1.094	56.51	7.10 12.0	1.048	58.17	8.18 14.1	1.062	61.12	10.47 20.6	1.444	61.12	10.47 20.6	1.444
7th ".....	50.74	4.80 9.5	1.020	51.82	5.46 10.5	1.051	59.92	6.85 11.4	1.054	55.28	6.77 12.9	1.061	54.74	10.23 16.0	1.474	54.74	10.23 16.0	1.474
8th ".....	64.66	4.71 7.4	1.092	51.45	2.96 5.8	1.028	59.53	5.02 9.4	1.040	55.70	6.97 12.5	1.056	58.79	7.47 11.4	1.464	58.79	7.47 11.4	1.464
9th ".....	70.27	5.50 7.8	1.092	50.89	4.39 4.7	1.046	68.68	7.39 10.8	1.030	54.74	6.81 11.0	1.054	61.09	8.21 14	1.464	61.09	8.21 14	1.464
10th ".....	65.00	1.35 1	1.044	47.08	2.39 2.2	1.018	60.33	5.36 8.9	1.034	61.91	6.81 11.0	1.054	59.54	5.47 9	1.468	59.54	5.47 9	1.468
11th ".....	57.97	7.0	1.024	42.48	4.4 3.8	1.018	57.91	4.55 4.4	1.032	61.17	7.02 11.4	1.046	53.12	6.34 10.1	1.444	53.12	6.34 10.1	1.444
12th ".....	56.30	1.35 1	1.044	55.55	4.14 3.2	1.018	92.04	2.72 4.3	1.020	62.15	5.86 9.4	1.094	63.44	4.44 8.6	1.464	63.44	4.44 8.6	1.464
13th ".....	51.94	7.9	1.15	42.48	1.78 3.1	1.016	58.43	2.18 3.7	1.020	58.07	1.78 6.4	1.076	63.44	4.44 8.6	1.464	63.44	4.44 8.6	1.464
14th ".....	.....	.....	.....	57.91	1.10 2.0	1.018	53.45	1.76 1.3	1.024	60.17	1.14 7.4	1.076	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
15th ".....	.....	.....	.....	57.91	3.5 3.0	1.018	18.75	1.46 1.0	1.024	60.89	1.04 5.5	1.080	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
16th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
17th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
18th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
19th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
20th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
21st ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
22d ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
23d ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
24th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
25th ".....	.....	.....	.....	55.55	4.07 4.8	1.018	60.50	3.34 3.5	1.018	43.32	1.86 3.5	1.024	61.12	1.04 5.1	1.080	61.12	1.04 5.1	1.080
Total.....	791.28	48.74	.....	1150.60	110.03	.....	1520.65	129.13	.....	1484.72	147.28	.....	1455.54	141.15	.....	1455.54	141.15	.....
Reserved Extract.	.....	48.41	.....	60.31	.....	.....	58.99	.....	.....	54.89	.....	.....	74.31	.....	.....	.....	.....	.....
Extract carried forward.....	47.13	.....	.....	49.71	.....	.....	71.1	.....	.....	91.59	.....	.....	118.84	.....	.....	100.50	.....	.....
Actual Extract obtained.....	99.74	.....	.....	64.80	.....	.....	71.1	.....	.....	77.14	.....	.....	118.84	.....	.....	47.40	.....	.....

In interpreting the results of this table the disturbing effect of the trials of different degrees of moistening and different length of maceration, must be borne in mind as largely concerned in the discordant results. But this discordance fairly shows first the necessity for careful investigations and trials, since otherwise the discords would have escaped observation; and next shows the certainty with which each operation tends to control and correct the results of the preceding one until uniformity be reached. The residue of each percolation was critically examined by tasting, and in none was the exhaustion absolute. As the percolators were emptied the upper eighth would be tasteless as a rule; then the bitter taste would be perceptible and would gradually increase to the bottom. At three-fourths down it would be very decided, and the remaining fourth would be pretty strongly bitter. The different percolations were only moderately uniform among themselves, and the want of uniformity was mainly in the lower third of the residue. But the residues were much more uniform among themselves than were the proportion of extract obtained, and all were fairly exhausted. The first and sixth percolations gave the most thoroughly exhausted residues, and yet the extract obtained, as shown by the table, was about two to one. This shows in a striking way that the extractive matter is not a measure of the exhaustion as judged by the bitterness of the residue. Therefore in using the quantity of extract as a guide to exhaustion, if the quality of the extract be not ascertained the condition of the residue must be used as a check upon the extract as a guide.

The general result however, as shown by even a glance at the table, —a result that could be obtained in no other way,—though favorable to repercolation, is unexpectedly unfavorable to the menstruum used because of the overloading and masking effect of the excess of soluble extractive matter in this exceptionally rich, soft, soluble bark. Therefore another percolation,—the seventh of this series,—was made with another grade of *Cinchona* using the same weak percolates and menstruum. This *Cinchona* was the poorest in the writer's possession. It is from the *C. officinalis* cultivated in Ceylon, and contains between 4 and 5 per cent. of total alkaloids, of which about three-fourths is quinia. Therefore though still much richer than the U. S. P. Yellow *Cinchona* it is much nearer to it than the Java *Cinchona* is. This 8 ounces = 226.7 grams. of the new powder was as well exhausted as the other percolations with 1136.33 grams. of percolate in 5 portions of

about 8 ounces = 226.8 grams. each. These portions, by the same calculations, yielded respectively 59.85, 37.26, 22.16, 7.15 and 2.77 grams, = 129.19 grams. of extract. Of this 102.45 grams. was carried forward to it in weak percolates from the sixth percolation of the table. The 8 ounces = 226.8 grams. reserved contained 59.85 grams. of extract, leaving 4 portions of weak percolate to be carried forward containing $(129.19 - 59.85) = 69.34$ grams. of extract. But the extract which appears to have been obtained by this percolation is only $(129.19 - 102.45) = 26.74$ grams. and yet the powder was about as well exhausted as any of the previous percolations, and the weak percolates carried forward were much less loaded with extractive.

This improvement of the process by the use of a less exceptional quality of Cinchona was however still evidently insufficient, and left it still short of the best results. The menstruum was next to be changed, as it plainly needed more alcohol to exclude some of the extract, and probably less glycerin.

A new menstruum was made consisting of 5 parts stronger alcohol, 4 parts water and 1 part glycerin. The s. g. of this mixture was .9575 at 15.6° C. = 60° F., or .9496 at 25° C. = 77° F. A cubic centimetre of this menstruum carefully weighed and evaporated on a watch-glass left 7.75 per cent. of glycerin not evaporable at the temperature to which the fractions of percolate were submitted. A new series of percolations was started with this menstruum, and was conducted precisely as with the former series. The first two percolations were made with the rich Java Cinchona so as to compare the results of the two menstrua upon the same powder; and then a third percolation was made with the Ceylon powder for comparison with the other menstruum upon this powder as above given in the seventh percolation of the former series. There was not time to extend this series beyond the third percolation, but fortunately the indications from the three are pretty clear. In this series the percolate was divided into portions of 8 ounces = 226.8 grams. each except the first portion of the first percolation, which was 6 ounces = 170.1 grams. and the powder in each was moistened with 8 ounces = 226.7 grams. of menstruum or weak percolate. So moistened it could not have been passed through the sieve at once, but by standing for the prescribed 8 hours in a closely-covered vessel the liquid was absorbed by the powder, and then it was easily passed through the sieve. When moistened to this extent the powder must not

be firmly packed, and it is quite important to use the largest practicable quantity of liquid to moisten the powder in repercolation. The results of these percolations are given in the following table.

Repercolation of Cinchona,—*Menstruum* 5, 4 and 1, s. g. '954 at 20° C.

Portions of Percolate of about 8 ounces=226.7 grams, each.	JAVA CINCHONA.								CEYLON CINCHONA.			
	First Percolation.				Second Percolation.				Third Percolation.			
	Grammes.		Dry Extract.	Difference in Spe- cific Gravity.	Grammes.		Dry Extract.	Difference in Spe- cific Gravity.	Grammes.		Dry Extract.	Difference in Spe- cific Gravity.
	Weight of Por- tions of Per- colate.	Weight of Dry Extract.			Weight of Por- tions of Per- colate.	Weight of Dry Extract.			Weight of Por- tions of Per- colate.	Weight of Dry Extract.		
1st portion.....	170'20	48'44	28.4	'1264	226'93	74'77	32.9	'1384	226'84	58'18	25.7	'1048
2d ".....	226'80	31.42	13'9	'0672	227'00	45'31	20.0	'0880	227'11	28'00	12'3	'0480
3d ".....	226'75	8.02	3.1	'0102	226'85	5'95	2.7	'0180	226'80	17.94	7.0	'0340
4th ".....	206'17	2.96	1.4	'0052	226'78	3.88	1.8	'0092	227'00	15'35	6.8	'0268
5th ".....	114'61	'37	'3	'0060	226'83	2.60	1.1	'0124	226'91	8'84	3'9	'0192
									226'70	2.33	1'6	'0140
									226'82	1'29	'5	'0090
Total.....	944'53	91'21	.....	.....	1134'39	132'51	.....	.....	1588'18	131'93	.....	.....
Reserved Ext....		48'44	.....	.....		74'77	.....	.....		58'18	.....	.....
Extract carried forward.....		42'77	.....	.....		57'74	.....	.....		73'75	.....	.....
Actual extract obtained.....		91'21	.....	.....		89'74	.....	.....		74'19	.....	.....

It remains now to give a summary of the results obtained from these two series, as bearing upon the relation between the weight and measure of the reserved portion of each percolation.

FIRST SERIES OF PERCOLATIONS.				SECOND SERIES OF PERCOLATIONS.			
Reserved Portions.	Weight, Grammes.	Measure, Cubic Cent.	Difference Per cent.	Reserved Portions.	Weight, Grammes.	Measure, Cubic Cent.	Difference Per cent.
1st Percolation.....	171'10	156	7'6	1st Percolation.....	170'20	158	7'1
2d ".....	226'80	214	6.0	2d ".....	226'90	210	7.5
3d ".....	226'80	210	7.5	3d ".....	226'80	216	8'5.0
4th ".....	226'80	208	8.3	4th ".....	226'80	208	8'3
5th ".....	226'80	204	10.1	5th ".....	226'80	.....	.....
6th ".....	226'80	201	11.4				
7th ".....	226'80	206	9.2				

The deductions which the writer draws from the work here given as applicable to the present pharmacopœial practice, and that which may be desired for the future are mainly as follows :

First, that the present formulas and processes for percolation are so defective that the relation to the drug which they profess is not practically accurate either as to quality or quantity, and therefore that a better process is greatly needed.

Second, that the process by repercolation, though it has some grave disadvantages, and is liable to defects in practice,—yet gives far better results both in quality and quantity of product ; while it is not difficult in practice except by comparison with the delusive simplicity of the former processes ; and therefore that repercolation is better adapted to pharmacopœial use as a model or standard process than any which has yet been tried.

Third, that repercolation may be used on a scale as small as 4 or 8 ounces, by great care and skill, but is not very successful with less than an avoirdupois pound of material for each percolation.

Fourth, that powders for percolation should not be finer than No. 60 for hard compact substances, nor coarser than No. 40 for more loose and spongy substances,—with a few special exceptions.

Fifth, that the menstruum should be so adjusted as to dissolve out the medicinal principles with the least practicable disturbance of their natural relations to each other and to the extractive matters whereby they are rendered soluble and permanent. Next that the menstruum should contain the smallest practicable proportion of alcohol ; and glycerin only when absolutely necessary, as in Cinchonas. And finally that the menstruum should be so adjusted that when the fluid extract represents the drug weight for weight it should also represent the drug by not less than 90 minims to the 100 grains, or more than 97 minims to the 100 grains, since by repercolation the exhaustion is never less than 90 per cent. and perhaps rarely more than 97 per cent. of the total soluble matter.

Sixth, that the powder be moistened with as much liquid as it can be made to hold and yet pass through a No. 8 sieve ; that it be not tightly packed ; and that it be well macerated before starting the percolation.

Seventh, that the rate of percolation be uniform and very slow. At first, for the reserved portion, the percolate in 24 hours should

not exceed the weight of the powder; nor need the rate be slower than to obtain the weight of the powder in 48 hours, although as a general rule the slower the rate the better the results. After the reserved portion the rate may be increased gradually so that the last portion be received in about 6 hours. The separate portions of weak percolate should not exceed the weight of the powder.

Eighth, that a good practical exhaustion requires,—as a general rule, —for the first percolation, with fresh menstruum, that the total percolates should weigh 3.5 times the weight of the powder. That for the second percolation or first repercolation, the weight should be 4.5 times that of the powder. And for all subsequent repercolations the weight should be 5, 6 or 7 times that of the powder, according to the nature of the substance percolated, and the skill and care with which the process is managed.

Ninth, that the relation of weight for weight, instead of minim for grain, should be established under proper controlling conditions. But that unless properly guarded in the quality and moisture of the drug used, the new relation is liable to be even more inaccurate than the old, because, the poorer the quality of the drug the less dense will be the percolates, and the greater will be the volume for the prescribed weight, and this involves the serious difficulty that when the fluid extract is made by weight but administered by measure, the poorer the drug from which it was made the smaller, as well as the weaker, the dose will be.

Tenth, that some good practical method of comparing fluid extracts by a standard is very much needed; and that for such drugs as Cinchona, a method of arithmetical dilution would be easy and practical if well worked out.

Whilst the above-mentioned work on Cinchona was in progress a paper by Mr. J. U. Lloyd of Cincinnati appeared in the "Am. Jour. Phar." for 1878, p. 1, upon Fluid Extract of Cimicifuga. This paper contains so many valuable observations made without bias, and with such care and labor as at once to command attention. The results however were in many important respects so at variance with those of the previous experience of this writer as to force upon him the conclusion that Mr. Lloyd might have misinterpreted some of his observations; and if so it was important that his work should be gone over in the light of the many useful suggestions it contains for those who

might follow him. It is regretted that he did not refer to later papers on the subject of percolation and repercolation,—or at least did not adopt some important modifications that are published in later papers.

His work upon *Cimicifuga* has been repeated by precisely the same method as given above for *Cinchona*,—that is in accordance with the later experience on percolation and repercolation,—and the results are given. Those who will compare these results with those of Mr. Lloyd will find important discrepancies which must belong to one set of observations or the other. On one important point Mr. Lloyd must reach a wrong conclusion, for it certainly can be demonstrated upon well known physical laws, that maceration to a proper extent is useful and necessary to other conditions of the problem. This point is so well established by general experience that this part of his work was not gone over. The formula and process adopted here were as follows :

Take of *Cimicifuga*, in powder No. 60, 32 parts.
Stronger Alcohol, s. g. .819 at 15.6°C=60°F,
or s. g. .811 at 25°C.=77°F., a sufficient quantity.

Moisten 8 parts of the *Cimicifuga* with 2 parts of the Alcohol, and pack it firmly in a percolator. Then pour Alcohol on top until the moist powder is thoroughly filled with liquid and the air is forced out, cover the percolator and macerate for 48 hours. Then arrange the percolator for an automatic supply of menstruum, and start the percolation at such a rate as to give about one part of percolate every three hours. Reserve the first 6 parts of percolate, and continue the percolation to practical exhaustion, receiving the weaker percolate on separate portions of about 4 parts each.

Then moisten a second portion of 8 parts of the *Cimicifuga* with 2 parts of the second percolate from the first portion of powder, pack it firmly in a percolator, and supply it on top, first with the remaining 2 parts of the second percolate from the first portion, and then with the successive weak percolates in the order in which they were obtained, until the moist powder is entirely filled with liquid. Then macerate for 48 hours, and percolate to practical exhaustion at the same rate as in the first portion of the *Cimicifuga*, using first the weak percolates in their proper order, and then fresh menstruum. Reserve the first 8 parts of percolate, and receive the weak percolate in separate portions of about 4 parts each.

Then moisten a third portion of 8 parts of the *Cimicifuga* with 2 parts of the second percolate from the second portion of the *Cimicifuga*, and conduct the percolation in exactly the same manner as in the second portion, reserving the first 8 parts of percolate.

Then moisten the remaining 8 parts of the *Cimicifuga* for a fourth percolation, and conduct it in exactly the same manner as the second and third portions.

Mix the four reserved percolates, weighing 30 parts, and set it by as finished Fluid Extract of *Cimicifuga*: and having properly labelled and numbered the separate portions of weak percolate, set these by until the process for making this preparation is to be resumed, and then use them exactly as in the second, third and fourth percolations, reserving 8 parts of the first percolate from each 8 parts of powder as the finished fluid extract, ever after, and setting aside the weak percolates from each operation to be used in the next succeeding one.

In applying this formula and process each part was represented by a troyounce, and therefore the percolations were made with 8 troyounces of powder each. For the purposes of this trial the percolate was separated in portions of about 2 troyounces or 62 grams. each instead of 4 troyounces as indicated in the process, and each separate portion was carefully weighed. A cubic centimetre of each portion of percolate was carefully weighed on a flat watch-glass, and then dried and the dry extract weighed. Then a proportion was made by calculation from these data to find the total dry extract in each portion of the percolate, this proportion being as follows: As the weight of the cc. of percolate is to the weight of dry extract which it yielded, so is the whole portion of the percolate to the dry extract it contains. Having thus obtained the total dry extract contained in each portion of percolate, the sum of these would be the total extract of all the portions. But as these portions varied in weight the series would not represent the rate of exhaustion. Therefore another proportion was made to show the rate or progress of exhaustion by the percentage of dry extract contained in each portion of percolate. The formula for this proportion is as follows: As the weight of the portion of percolate is to the weight of extract which it contains, so is 100 to the percentage of the dry extract contained in the portion of percolate. The difference of specific gravity between the menstruum and the percolate, which also shows the rate of exhaustion was obtained by a small s. g. flask.

The following table gives the detail of these observations in compact form, but, as it was found by examination of the residue that the strong alcohol did not fully exhaust the *Cimicifuga*, the percolations were only carried as far as the third, at which point it was determined to try a new menstruum, in another process.

Cimicifuga, with Stronger Alcohol.

Portions of Percolate.	First Percolation.				Second Percolation.				Third Percolation.			
	Grammes. Weight of Per- colate	Dry Weight of Dry Extract.	Per cent. of Extract.	Difference of S. G.	Grammes. Weight of Per- colate.	Dry Weight of Dry Extract.	Per cent. of Extract.	Difference of S. G.	Grammes. Weight of Per- colate.	Dry Weight of Dry Extract.	Per cent. of Extract.	Difference of S. G.
1st.....	62'20	7'78	12'51	'0444	63'41	12'15	19'16	'0636	61'22	10'98	17'93	'0556
2d.....	65'35	6'25	9'56	'0330	64'23	8'08	12'58	'044	66'35	8'53	12'86	'0476
3d.....	64'51	4'84	7'50	'0264	63'12	6'82	10'80	'0328	64'30	6'97	10'84	'0372
4th.....	63'03	3'36	5'33	'0232	62'54	4'22	6'74	'0240	55'00	4'79	8'71	'0352
5th.....	61'22	2'30	3'76	'0184	61'65	3'54	5'74	'0204	62'00	4'32	6'97	'0272
6th.....	60'24	1'69	2'80	'0140	62'36	2'90	4'65	'0164	62'22	3'38	5'43	'0224
7th.....	61'00	1'30	2'13	'0116	63'11	2'63	4'17	'0128	63'34	2'76	4'36	'0184
8th.....	60'02	1'09	2'15	'0108	63'41	2'21	3'49	'0104	62'24	2'51	4'03	'0143
9th.....	65'37	1'11	1'70	'0096	62'12	1'76	2'83	'0068	62'56	2'18	3'48	'0124
10th.....	61'86	1'11	1'70	'0028	62'32	1'53	2'40	'0041	63'06	1'68	3'12	'0096
11th.....	112'52	'91	'81	'0036	62'24	1'39	2'23	'0060	64'02	1'80	2'81	'0100
12th.....	108'01	1'25	1'16	'0016	63'33	1'16	1'83	'0044	63'44	1'68	2'65	'0100
13th.....					80'01	1'77	2'21	'0060	62'32	1'20	1'92	'0082
14th.....					98'00	1'90	1'94	'0052	66'80	'99	1'35	'0018
Totals.....	845'33	33'19			931'85	52'06			878'87	53'98		
Reserved Extract..		18'87				31'27				31'27		
Extract carried forward.....		14'32				20'79				22'71		
Extract from each Percolation.....		33'19				37'74				33'19		

The first percolation of the table being simply a percolation with fresh menstruum to practical exhaustion, serves to compare and check the other percolations in their results. The 8 troyounces of *Cimicifuga* = 248·8 grams. required 845·33 grams. of percolate for practical exhaustion, though this was short of actual exhaustion. The total percolate is therefore nearly three and a half times the weight of the powder, and is as little as will give a practical exhaustion of this drug with this menstruum. This is more than double the proportion of the official U. S. P. formula, and accounts for a part of the defects of the official preparation. The extract obtained for this first percolation

of the table is 33.19 grams. or $(248.8 : 33.19 :: 100 :) 13.34$ per cent. of the weight of the powder. Then as these percolations were made by repercolation, the total extract should be $(33.19 \times 3 =) 99.57$ grams. But the total obtained $(33.19 + 37.74 + 33.19 =) 104.12$ grams. slightly exceeds this, showing that the total exhaustion was rather better than the first of the series.

Now if the total extract to be expected from the 24 troy-ounces $= 746.4$ grams. of powder be 99.57 grams., and as the finished fluid extract is to weigh only $(6 + 8 + 8 =) 22$ troyounces $= 684.2$ grams., then the extract which should be contained in the reserved portions which constitute the finished fluid extract should be (As $746.4 : 99.57 :: 684.2 :$) 91.27 . But really the total extract in these reserves is only $18.87 + 31.27 + 31.27 =) 81.41$ grams. or 10.16 grams. less than it should be. This deficit is mainly due to the process having been stopped at the third percolation instead of being carried on to include the fourth. In order that the fluid extract should represent the drug grain for grain, or weight for weight, if the extract was all of equal medicinal value, the reserved percolates should weigh $186.4 + 248.8 + 248.8$ grams., and should contain $24.9 + 33.19 + 33.19$ grams. This fluid extract, to have represented the drug in the relation of minim for grain should have measured $(177.12 + 236.16 + 236.16 =) 649.44$ cc., but it really measured 676 cc., and therefore the minim did not represent the grain ($\frac{6}{6} \frac{49}{76}$) though the preparation is much stronger than the officinal one which purports to have this relation.

To endeavor to remedy the apparent defects of this process and make a preparation which shall more nearly represent the entire drug, another set of repercolations was made with a new menstruum. As the officinal menstruum, namely stronger alcohol, did not fully exhaust the drug, and separated out the resinous portions from their natural associates and solvents in the drug, the attempt was made to go to the other extreme and try a solvent or menstruum which should contain perhaps too little alcohol, and if so, yield a preparation overloaded with extractive matter, so that by comparing the results of the extremes, a better menstruum than either extreme might be found. With this object the new menstruum was made of equal parts (by weight) of stronger alcohol s. g. $.819$ at 15.6° C. $= 60^{\circ}$ F., or $.811$ at 25° C. $= 77^{\circ}$ F. and water. This mixture required $26.5\bar{3}$ of water to 2 pints of

stronger alcohol. The s. g. of this mixture is $\cdot 926$ at $15\cdot 6^{\circ}\text{C}.=60^{\circ}\text{F.}$ or $\cdot 919$ at $25^{\circ}\text{C}.=77^{\circ}\text{F.}$ or $\cdot 9236$ at the room temperature at which the weighings were made.

The same formula and process were used as in the first repercolations of *Cimicifuga*, with the exception of the menstruum, and the powder was from the same stock, and used on the same scale of a troy-ounce= $31\cdot 1$ grams. for each part, and therefore 8 troyounces= $248\cdot 8$ grams. of powder for each percolation; and in this case the whole four percolations were made. The following table gives the results of this repercolation, and contains the same elements obtained in the same way, but the first percolation attained a much more thorough exhaustion, while the subsequent ones were not carried so far on account of the apparent inertness of the extractive matter obtained. The third percolation was much less successful than the others in consequence of too short a maceration. This carried too much of the extract forward by the weak percolates into the fourth percolation, and overloaded it. But this serves as an excellent example of the way in which the errors of one percolation are corrected by those which follow when repercolation is used.

Cimicifuga with New Menstruum.

Portions of Percolate.	FIRST PERCOLATION.					SECOND PERCOLATION.					THIRD PERCOLATION.					FOURTH PERCOLATION.				
	Grammes.	Weight of Per- colate.	Weight of Dry Extract.	Per cent of Dry Extract.	Difference of S. G.	Grammes.	Weight of Per- colate.	Weight of Dry Extract.	Per cent of Dry Extract.	Difference of S. G.	Grammes.	Weight of Per- colate.	Weight of Dry Extract.	Per cent of Dry Extract.	Difference of S. G.	Grammes.	Weight of Per- colate.	Weight of Dry Extract.	Per cent of Dry Extract.	Difference of S. G.
1st.....	69.18	23.55	34.04	1212	67.78	22.56	33.20	1104	64.67	16.89	26.12	90.48	67.55	24.53	36.31	12.4	67.55	24.53	36.31	12.4
2d.....	70.72	19.45	27.50	0944	64.59	15.65	24.23	0824	64.22	14.58	22.70	0868	65.07	21.10	32.58	1148	65.07	21.10	32.58	1148
3d.....	66.88	13.27	19.70	0716	65.07	15.14	23.77	0820	66.17	13.13	19.84	0728	57.92	15.28	26.38	0928	57.92	15.28	26.38	0928
4th.....	64.34	9.72	15.10	0548	66.16	14.08	20.36	0706	66.67	11.62	10.00	0636	58.70	13.06	22.25	0820	58.70	13.06	22.25	0820
5th.....	64.35	7.12	11.03	0408	76.12	7.92	16.11	0556	65.90	9.85	14.95	0336	53.34	7.22	13.54	0824	53.34	7.22	13.54	0824
6th.....	62.34	4.48	7.18	0318	63.73	7.92	12.43	0452	60.43	7.45	12.33	0432	60.49	9.25	15.29	0560	60.49	9.25	15.29	0560
7th.....	62.31	3.19	5.12	0248	65.14	6.25	9.58	0372	59.80	8.63	9.95	0344	55.63	8.24	12.55	0480	55.63	8.24	12.55	0480
8th.....	83.27	2.52	3.03	0160	64.50	5.98	9.27	0348	59.89	4.40	7.73	0284	58.34	6.84	11.72	0452	58.34	6.84	11.72	0452
9th.....	107.89	93	86	0080	88.97	5.21	5.95	0244	53.83	5.25	7.53	0268	66.83	7.36	11.01	0436	66.83	7.36	11.01	0436
10th.....	56.52	46	81	0072	65.03	1.70	2.04	0138	62.49	3.66	6.77	0248	65.17	6.03	9.25	0364	65.17	6.03	9.25	0364
11th.....	65.64	18	27	0096	64.43	1.49	2.31	0118	63.66	4.17	6.55	0210	59.91	6.05	10.09	0364	59.91	6.05	10.09	0364
12th.....	63.91	03	.....	0044	64.43	1.54	2.41	0086	54.35	2.67	4.91	0108	63.99	5.21	8.14	0332	63.99	5.21	8.14	0332
13th.....	121.02	06	.....	0056	63.94	1.10	1.72	0066	112.57	3.88	5.22	0196	63.68	4.51	7.08	0332	63.68	4.51	7.08	0332
14th.....	.....	.....	.....	.....	63.94	1.01	1.51	0038	63.57	3.00	4.72	0172	61.60	3.43	5.57	0296	61.60	3.43	5.57	0296
15th.....	.....	.....	.....	.....	63.80	1.68	1.70	0026	63.57	1.99	3.13	0171	59.70	2.97	4.98	0204	59.70	2.97	4.98	0204
16th.....	.....	.....	.....	.....	39.59	.....	.....	.....	89.14	2.99	3.25	0156	63.10	2.19	3.26	0132	63.10	2.19	3.26	0132
17th.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61.80	1.05	1.66	0108	61.80	1.05	1.66	0108
18th.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100.86	1.14	1.13	0064	100.86	1.14	1.13	0064
19th.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67.11	1.58	1.86	0040	67.11	1.58	1.86	0040
20th.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	958.57	84.96	.....	.....	1050.22	114.92	.....	.....	.....	.....	1167.98	.....	.....	.....	.....	1287.98	.....	.....	.....	.....
Reserved Ext.....	56.27	.....	.....	.....	67.43	.....	.....	.....	.....	.....	56.22	.....	.....	.....	.....	73.97	.....	.....	.....	.....
Extract carried forward.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ext. from each Percolation.....	.....	28.09	.....	.....	.....	47.49	.....	.....	.....	.....	63.19	.....	.....	.....	.....	73.06	.....	.....	.....	.....
.....	.....	84.96	.....	.....	.....	86.23	.....	.....	.....	.....	71.92	.....	.....	.....	.....	73.84	.....	.....	.....	.....

The first percolation of 8 troyounces=248.8 grams. required a total percolate of 958.57 grams. for exhaustion, or nearly four times the weight of the powder, and gave 84.96 grams. of extract, which is

34.14 per cent. of the weight of the powder. The 32 troyounces=995.33 grams. of powder should therefore give $(84.96 \times 4 =) 339.84$ grams. of extract. But when the extract actually obtained from the four percolations is summed up, it is found to be only $(84.96 + 86.23 + 71.92 + 73.84 =) 316.95$ grams. or 22.89 grams. less than the indicated quantity. This is therefore an apparent loss of (As $995.33 : 316.95 :: 100 : 31.84$, and $34.14 - 31.84 =$) 2.3 per cent., which considering the apparent quality of final extracts in repercolation, is quite unimportant, at least in view of the far greater deficiencies of the officinal processes, or any modification of them hitherto used.

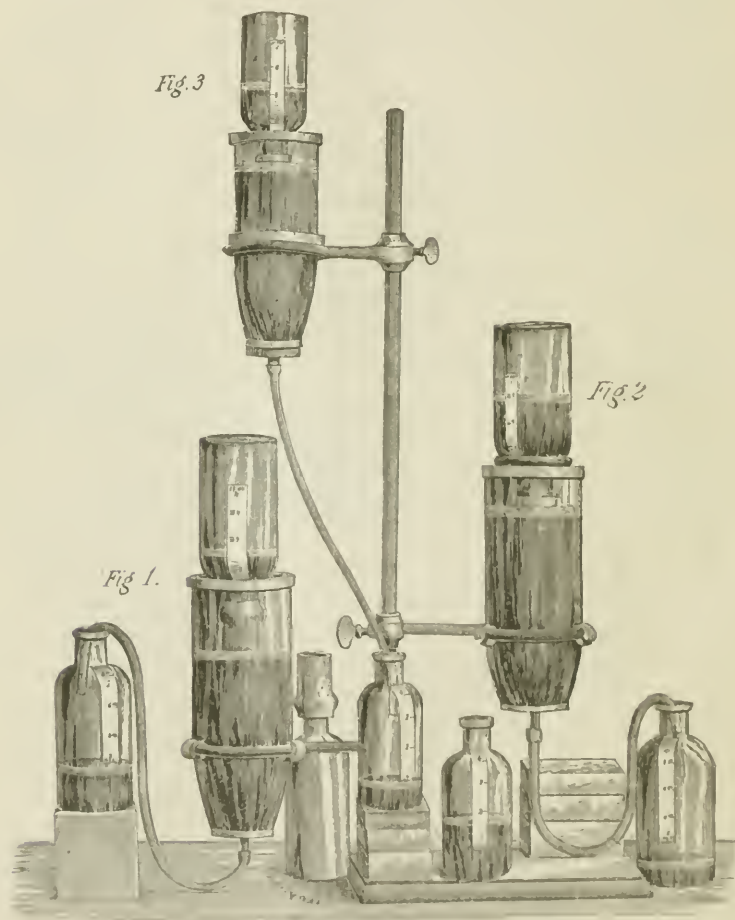
Now if each troyounce of powder is to be represented by a troyounce of the fluid extract, and the fluid extract be adjusted to the solid extract obtained, then the reserved percolates should weigh, respectively, 186.6, 248.8, 248.8, and 248.8 grams. and should contain 59.41, 79.22, 79.22, and 79.22 grams. of extract. But by the table the reserves weigh 206.78, 266.60, 261.73 and 249.24, and contain 56.27, 67.43, 56.22 and 73.97, thus making a very imperfect exhibit though still far ahead of the present or past officinal processes. The conditions being new each percolation was varied in management in order to reach the best method, it was not reached until the fourth percolation, and one or two more percolations, using much more liquid to moisten the powder, would have been needed to obtain greater precision and uniformity. The total finished fluid extract which should represent 30 troyounces=933 grams. of the drug, when made to bear the relation of minim for grain weighed 984 grams. and was therefore considerably too heavy. This, and the tendency of the percolate to become overloaded with extractive, at the same time that it illustrates the value and appropriateness of the principle of repercolation, also shows that this new menstruum has too little alcohol, and leads to the inference that a menstruum of 2 parts stronger alcohol and 1 part water would be better adapted to *Cimicifuga* than either of the extremes here tried. Such a proportion would, by repercolation, probably yield a fluid extract which in the proportion of weight for weight, would also have the proportion of minim for grain,—or what would represent the drug better because more accurately than by any known method of percolation,—including repercolation,—namely 90 to 95 minims for each 100 grains of the drug. In readjusting all fluid extracts therefore to bear the relation of weight for weight to the drug,

the weight should measure in minims from 90 to 95 minims for every 100 grains to make the therapeutic value of the minim and grain, of the fluid extract and the drug practically equal. This can be readily done by variations in the menstrua used, but not without the expenditure of much time, skill and labor,—an amount which no individual or committee can afford to give, but which a Pharmacopœia must have, in order to be respected as a standard. It may be mentioned in illustration of this point that all the time and labor that the writer could possibly spare, including at least three evenings of every week, for three and a half months, has been given to this paper which embraces only two fluid extracts, neither of which are yet in the condition they should be for the Pharmacopœia for want of more time and labor.

It now remains to give some account of the mechanical contrivances which, in the hands of the writer, seem best adapted to a uniform and practically good exhaustion of the soluble portions of drugs without the use of heat, so that the fluid extract of the drug shall bear a tolerably definite and uniform relation to the drug of minim for grain and weight for weight, for the writer now believes that both these relations can be had at once with a practical and sufficient degree of accuracy,—or with accuracy enough for the present relations of pharmacy to therapeutics. It can hardly be doubted that by a competent knowledge of known physical laws, and by a fair application of this knowledge to the problem, a fluid extract can be made by repercolation, without heat, bearing the proper relation, with great accuracy, but the success or want of success with which this is done will vary much more with the degree of knowledge and skill applied to it, than with any particular form of apparatus used. That is, the measure of success will always be in the application of well-known physical laws. The writer therefore desires to guard against any misleading effect of a simplicity that is not intended to be *ad captandum*, for it would be very hurtful to continue in the present to underrate a problem which has been so very much underrated in the past. If the principles involved, and the difficulties of carrying them out, be once fairly comprehended, the mechanical appliances may be easily varied, and yet must still leave some one contrivance as the best until a better be found.

No better form of apparatus has been found by the writer than that which has now been used, upon various scales, during the past twelve years, an account of which was published in 1872, and which is repro-

duced with improvement and amplification at the end of this paper. To simplify this apparatus with the slightest possible sacrifice of the principles involved, with the object of getting the principles to be better and more generally understood and applied where so much needed, is the object of introducing the modified apparatus shown in the following cut.



Scale, one-sixth of the actual linear size.

The cut presents three separate groups of apparatus in positions to illustrate three stages of repercolation, and it is to be understood that

all intermediate positions are often useful and necessary even in the same percolation. The support is a common apparatus stand, the rings of which are reduced to the proper size by short sections of rubber-tubing cut open and placed on the wire of the ring when needed; or, a section of larger tubing stretched over the percolator as in Fig. 3. The percolators are common lamp chimneys costing about 5 cents each, and are of the size and form known technically as "A" and "B" "Sun Chimneys." These are of very good form, though not the best, —for percolators, and should be selected with as small an opening for the stopper as possible, and with the smoothest, thickest and most regular edge, since it is practically impossible to stop some of their irregular edges tightly. The smaller size, Fig. 3, holds conveniently 4 ounces of most powders, and the larger holds 8 ounces,—to the points shown in the cut. A good soft cork, bored in the centre for a short piece of glass tube of not more than $\frac{1}{8}$ th of an inch or 3mm. bore, serves to close the small end of the chimney. A rubber cork is best, and such may be made of concentric sections of rubber tubing of different sizes; or, the largest cork at hand may be increased to the proper size by stretching around it short sections of rubber tubing. The short piece of glass tubing should not go quite through the cork on the inside, and should project about an inch=25mm. outside. A piece of rubber tubing of not over $\frac{1}{8}$ th inch=3mm. bore, and about 13 inches=325m. long has one end slipped onto the glass tube. If this tubing be much larger than the dimensions given it fails to be filled with the liquid, and then when the percolator is in the position of Fig. 3, it fails to perform the office of a Sprengel pump in exhausting the liquid and air bubbles from the lower part of the percolator. Two disks of blanket or thick flannel, and one of filtering paper cut a little larger than the inner surface of the cork, and laid upon it, complete the arrangement of the percolator. The powder, moistened with great care and uniformity is packed loosely, firmly or very firmly, according to its nature or condition, with the square end of a stick, say $\frac{1}{8}$ inch = .02m. diameter. As a rule the largest practicable proportion of liquid should be used in moistening the powder, because then the powder occupies the smallest space in the percolator,—requires the loosest packing, and is saturated for the maceration by the smallest additional quantity of liquid, and therefore gives the most concentrated first percolate for the reserve, and secures the most rapid exhaustion by the

smallest quantity of liquid. A disk of filtering paper is placed on the surface of the powder, of such size that the edge is reflected up against the glass. A disk of board, card-board, or better of thick sheet rubber with a central hole $1.5 \text{ inches} = .037 \text{ m.}$ in diameter, is used for a cover. A stratum of liquid, maintained at a uniform thickness of $.25 \text{ inch} = .006 \text{ m.}$ should cover the powder from first to last, so that it may not drain and contract, or admit air; and this is best maintained by an inverted bottle of the supply liquid, as shown in the cut. The length of the neck and mouth of such bottle may be conveniently elongated when needed so as to regulate the depth of the stratum of liquid above the powder, by stretching over it a short section of rubber tubing in the manner shown in the first group of the cut, Fig. 1. When the percolator is charged and ready for maceration the small rubber tube is turned up and fastened with a piece of thread or rubber band so that the end is considerably above the level of the liquid in the percolator, and in so adjusting it care must be taken not to close the tube, because as the liquid descends through the powder to fill up all the interstices it is important that the interstitial air should have a free exit by the tube.

The bottles for receiving the percolate are common round-shouldered prescription bottles, 4oz. for the small percolator, 8oz. for the larger. A strip of paper should be pasted lengthwise of the bottle, and at the lower end of this the tare should be marked. It should then be graduated to the quantities desired by weighing into it the proper quantity of water and marking at each level if more than one be desired. This graduation simply serves as a reminder to know when to try the bottle on the scale, for whether the finished fluid extract be adjusted weight for weight, or by an arbitrary weight in each case so as to get the relation of minim for grain, this must equally be done by weighing.

It is convenient to have 6 to 10 of such bottles, and then as soon as 4 are filled from one percolation another can be started, and thus relieve some of the bottles for use over again. The bottles should be numbered from 1 to 10 to keep the proper order of using them, and if more than one series is in use at the same time the second should be designated by the first letters of the alphabet instead of by numbers. The maceration should never be less than 48 hours; and a longer time does not seem to be of any use unless the powder be coarse and of hard particles. When the percolation is to be started the percolator is raised

to the position of Fig. 3, and the end of the exit tube placed in the bottle marked for the reserved percolate, for 10 or 15 minutes, in order that the bubbles of air may be driven out and the tube be filled with solid liquid. As soon as this condition is attained the percolator is lowered to the position of Fig. 1, and the receiving bottle is then to be adjusted higher or lower until a rate of dropping is established of not more than one drop per minute on this small scale,—and one drop every two minutes makes a better rate for such quantities. Indeed the rule for all percolations is, the slower the rate the more perfect the exhaustion, and with a smaller quantity of menstruum.

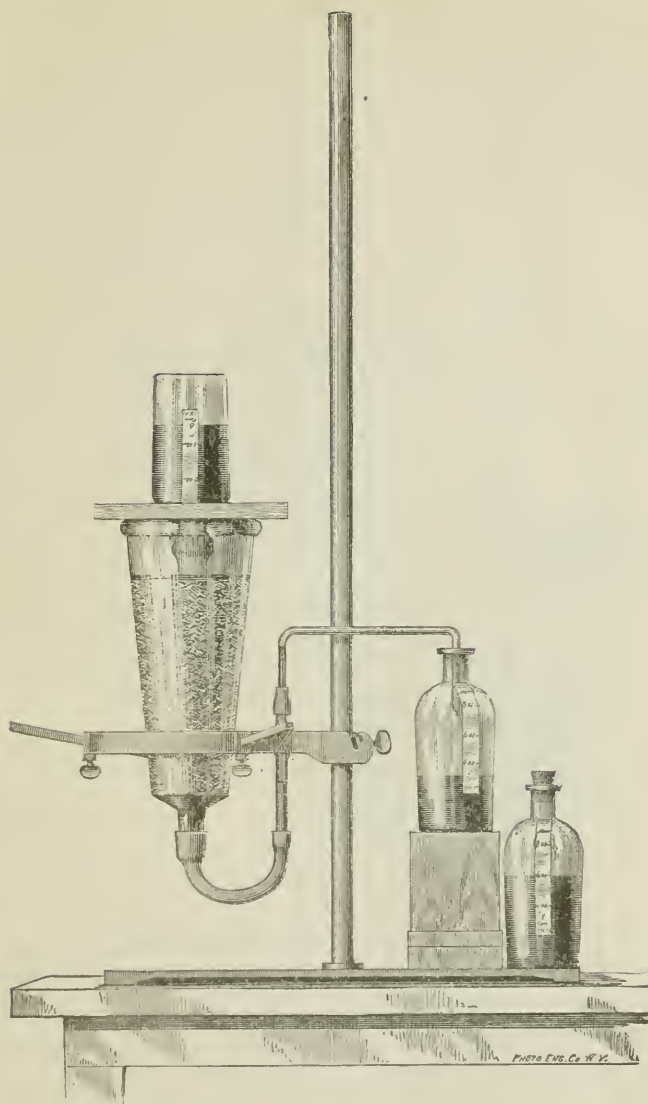
This slow rate and the automatic supply by the inverted bottle admit the process to go on night and day, but if it be desired to go slower, that a mark may not be passed in the night, the bottle has only to be raised or the percolator lowered a little; and by a still greater change of levels the dropping may be stopped altogether. On rare occasions when dropping at a uniform rate it will stop altogether, or become very slow. This is in consequence of a bubble of air getting over the orifice of the glass tube inside, and acting as an obstruction. If the tube be moved from side to side the air bubble will be started and pass down and the rate of dropping be resumed. If not thus dislodged it will most certainly be by raising the percolator for a short time into the position of Fig. 3. With some powders, and some degrees of moistening and packing the proper rate of dropping will require the position of Fig. 2, and in some stages of many percolations this position will be required. While if for want of skill and experience the packing be too hard the position of Fig. 3 may be needed from the first. But the best percolations are those obtained by the position of Fig. 1, where the whole mass is in the equilibrium of maceration, and the fluid all moves downward together at a very slow rate. As the more concentrated portions of percolate get through, the rate of dropping increases for any position, and occasionally, with loose packing, the position has to be altered to check it. But after the reserved portion has been received, and the quantity required to moisten the next powder, the rate of dropping may be doubled without much harm, and thus half the time be saved. The slow and uniform rate of dropping is the important point to be attained, and the various positions are simply means of accomplishing this. It is easy to obtain complete exhaustion. That is, a percolate almost colorless and tasteless, and having the same s. g.

as the menstruum, and how far short of this to stop the process cannot be indicated. But upon this small scale the percolate from the first portion should weigh from 3 to 4 times the weight of the powder; and for the repercolations from 5 to 6 times the weight of the powder. And then with fair exhaustion each time the results must continually check each other and improve until after 10 or 12 repercolations, a nearly mathematical accuracy must be attained, and ever after be maintained, all the variation being in the quality of the drug used. The writer has many series of repercolation, on various scales of quantity, which were started five years ago and suspended from one season of the fresh drug to another, but never interrupted to begin anew, and such would go on indefinitely and with entire uniformity of result if the drugs could be obtained of a quality as uniform as is the process.

Should this method by repercolation become officinal, or come into general use the apparatus makers would soon supply a flat-bottomed glass percolator and cover of better form than the lamp chimneys, and of all sizes at moderate prices. If so no better form could be adopted than that shown in the following cut, if the bottom be flat or very nearly so, and the exit tube be small enough to receive a rubber tube of not more than 3mm. in bore.

The following cut is a modification of the apparatus adapted to a rather larger scale, when the principles are applied in a slightly different way. It fulfills the purposes somewhat better than the lamp chimneys, and perhaps nearly as well in most cases as the one represented in the cut which follows it.

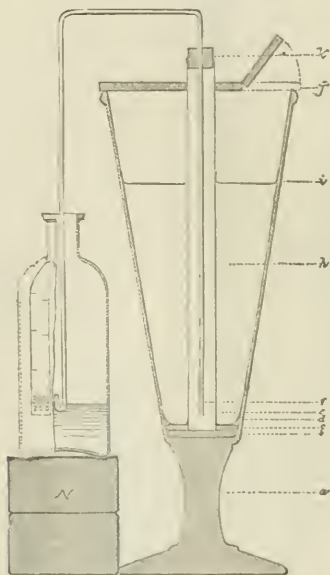
The chief object of presenting this illustration is to show a convenient way of applying the principles involved in the syphon percolator to the glass percolator in common use, in order to try to tempt those who have such percolators to try the method in percolation and repercolation. The cut is so plain and so easily understood that it needs but little explanation. The percolator is shown in the position of having been stopped for the night lest the receiving bottle should be filled beyond the proper mark. The syphon here is made in two parts, one end of the upper part being telescoped within a larger piece of glass tubing, and the junction made tight by a short section of rubber tubing through which the smaller tube is free to slide. During maceration, or when the percolation is arrested, the upper part of the syphon is drawn up until the liquid will no longer flow over into the bottle, and



Scale, one-sixth of the actual linear size.

the height at which this column of liquid ceases to flow over is a measure of the comparative density of the liquid within and without. As seen in the cut the liquid will not flow over into the bottle although

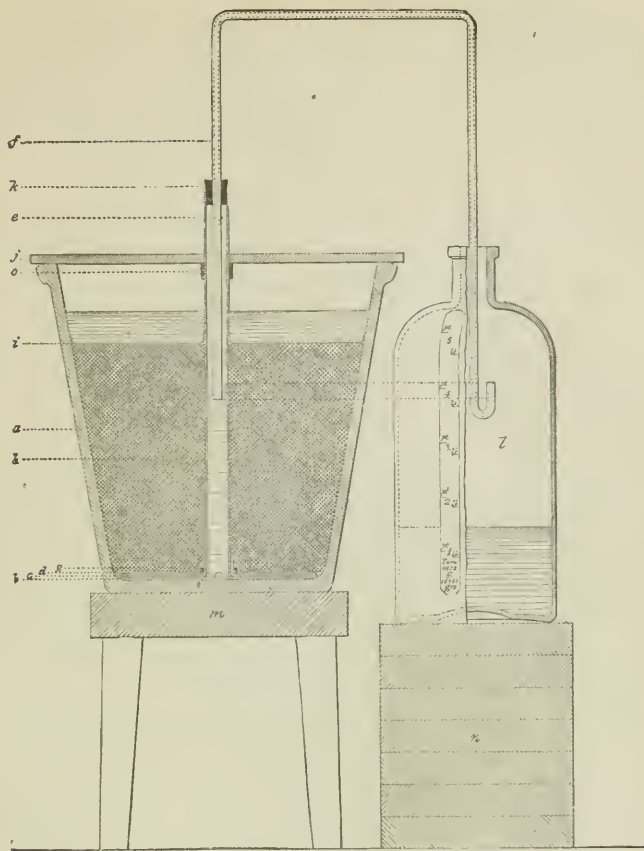
the column is several inches short of the height of the liquid in the percolator. But as exhaustion progresses, and the liquid in this column becomes less dense its counterbalancing height becomes greater, until finally when the powder is exhausted and the liquid within and without are of the same density the column rises to the level of the liquid within the percolator minus the friction and capillarity. When the percolation is to be started, the syphon is simply pushed down through the



Scale, one-sixth of the actual linear size.

rubber until the liquid flows over, and then the rate is established by carefully raising or lowering the syphon. This sliding joint for varying the length of this column of liquid at will, being understood, the other details are plain enough, whilst the charging and the general management are the same as in the smaller and larger percolators.

However attractive the simplicity of the lamp chimney arrangement may appear it does not yield so good results as the form of percolator reproduced here, with slight improvements, from the "*Proceedings of the Amer. Pharm. Asso.*" for 1872, p. 182, for several reasons. First because the principles involved are not so well carried out, and secondly



Scale, one-sixth of the actual linear size.

because the quantity of substance operated upon is too small. Very good and uniform results need hardly be looked for when the quantity operated on for each percolation is less than an avoirdupois pound. That is when less than that quantity is used, great care and skill are necessary to get good results. Another percolator, applying the same principles by the same details, but having about five or six times the capacity of the first, was soon after made and put into use, and cuts of these two percolators are shown upon this and the opposite page, of their relative sizes, both upon a scale of one-sixth of the actual linear dimensions, the reference letters denoting the same parts in both. Of

course the principles involved when once understood can be applied to vessels of any kind and size by means of common glass tubing, and in order to have these principles tried by less prejudiced persons than the writer the mechanism will now be given as plainly as possible, as applicable to this best form of apparatus.

The percolator, *a*, is of the form of the more modern glass or tin percolators somewhat funnel shaped to allow substances to swell without becoming impacted, but having no special angle. The smaller has a glass stem and foot like an ordinary celery glass, and the larger is an ordinary stone ware pot neither having an opening in bottom nor sides. The smaller is about 16 inches = 40 centimetres in height, of which height about 4 inches = 10 centimetres is stem and foot, and is of a proper capacity for 16 to 20 ounces = 500 to 600 gram. of material and a proper stratum of menstruum. The bottom, internally should be about 2 inches = 5 centimetres in diameter and should be flat,—not cup-shaped as the glass-blowers are apt to leave it. A rim of glass is made upon the upper edge or lip, to strengthen it, and this lip is ground off so that the cover may fit accurately to prevent loss by evaporation. The height of the foot and stem is not a matter of indifference, since if too short it has to be set upon a stand in order that the receiving bottle may be conveniently changed.

The larger percolator, *a*, is a stone ware pot of about 2 gallons = 7557 cc. capacity,—10 inches = 24 centimetres high and across the top, by about 6 inches = 14.4 centimetres across the bottom, inside, and it will conveniently hold 4.5 to 6.5 pounds = 2 to 3 kilos, and a proper stratum of menstruum. Both cuts are made one-sixth the actual linear size, and the same letters refer to the same parts of each, so that one description applies to both.

A disk of blanket, *b*, is cut of such a size and shape as to lie flat upon the bottom, and cover it entirely. Another disk of the same material, but a little larger, *c*, is made with a crucial incision in the centre, so that it may be stretched over the end of the well tube, *e*. The central or well-tube, *e*, is a simple piece of glass tube about 12 inches = 30 centimetres long, by .5 to .75 inch = 1.5 to 2 centimetres internal diameter, irregularly notched, or knawed off obliquely at the lower end. One end of this well-tube, *e*, is pushed through the crucial cut in the centre of the upper disk of blanket, *b*, and the blanket is pushed to the other end of the tube so that the corners made by

the crucial cut are reflected up against the outside of the tube. These corners are then tied firmly to the tube by passing twine around them, or, are secured by a stout rubber band, *g*, made of a section of rubber tubing of proper size. A disk of filtering paper, *d*, larger than the upper blanket, *c*, with a crucial cut in the centre, and nicked round the edge so as to lie flat against the sides of the percolator where reflected up against them. This disk of paper is pushed down upon the upper blanket, the well-tube passing through the crucial cut in its centre.

If now a piece of paper be twisted round the upper end of the well-tube, or a cork be temporarily stuck into it, to keep out the moistened powder, the percolator is ready to receive its charge which is packed around the well-tube and upon the disks of paper and blanket so as to occupy the main body of the percolator, *b*, up to about the position of *i*.

When the charge, having been properly moistened, rubbed, and sifted, so as to be entirely uniform and free from wet lumps, is packed around the well tube loosely or firmly according to the nature of the substance and the menstruum,—its surface is covered by a disk of muslin or paper, *i*, cut so as to lie flat and smoothly upon the surface. The object of this is to distribute the menstruum as it is poured on, and to prevent the stream from breaking up and deranging the surface. Should this disk show a tendency to float in the stratum of menstruum it may be weighted down by a few fragments of glass. The percolator is then ready to receive the menstruum or weak percolate, and a stratum of the liquid should be carefully kept covering the entire surface well until the whole mass of the substance to be percolated is entirely saturated. The cork is to be taken from the well-tube before the liquid is poured on, and then the liquid will pass down into the substance like a piston, pushing the interstitial air down before it to pass out through the blankets and the well-tube; and finally the liquid will rise in the well-tube until its surface is within an inch or so of the surface of the liquid outside.

The whole substance is now in a perfect condition for maceration, and the surface should be left covered with the liquid to the depth of at least $\frac{1}{4}$ inch = 1 centimetre. In the larger percolator a short section of rubber tubing, *a*, is stretched over the upper end of the well-tube, and slipped down so as to support the centre of the cover. A tightly fitting cover, *j*, made of sheet rubber $\frac{1}{25}$ inch = 6 millimetres

thick, with a hole in the centre for the well-tube, is then put on. If made of sheet rubber this cover fits so closely that it will soon save its cost by preventing loss of alcohol by evaporation. Its size in the larger percolator permits one side to be bent up when liquid is to be poured in. But in the smaller percolator it is very convenient to have one side of the cover cut two-thirds through from below, as shown in the cut, the undivided portion forming a good spring hinge permitting this part of the cover to be easily raised to pour on liquid. If a self-feeding bottle be used, as is generally advisable in order to keep the level of the liquid constant and thus obtain a flow at a uniform rate, it may be easily applied by making a hole of suitable size in the cover. When thus supplied and covered the maceration should continue for 48 hours at least. The whole arrangement now represents a well, dug in a wet soil of a substance to be percolated, and the proposition is, to pump out this well at so slow a rate that the liquid from outside the well coming in to supply that rate, through the disks of paper and blanket, which represent the gravel stratum of the soil,—may descend so very slowly as to be nearly frictionless. The object is, to give the whole liquid up as nearly as possible to gravitation, and to so diminish the rate of descent that the particles or portions of liquid which pass between and around the particles of solid matter may travel downward no faster than the portions of liquid which pass through the pores or interstices of the more solid substance whose soluble portions are to be washed out. Because, if the whole mass of liquid travelled downward at absolutely the same rate through a perfectly saturated mass of solid permeable substance partially soluble in the liquid, and if the molecules of liquid passed downward in absolutely straight lines, through some particles, but between others, and always at a uniform rate, it is easy to see that all the first portion of the liquid would come through saturated, and all the remainder would hold nothing in solution because the substance would be absolutely exhausted by just the quantity of liquid which it was capable of saturating. The writer has on one or two occasions made percolations so slowly as to somewhat approximate this theoretical result. The dropping in one case was not over 4 drops in each 24 hours, or about a cubic centimetre every 5 days. To pump out this well at a uniform rate which can be easily controlled, is therefore the most important element in a successful percolation, and the only one which has offered much difficulty in the

past. And it can only be effectually done by means of maintaining a difference of levels in the liquid inside and outside of the well-tube. The moment a drop of liquid is taken from the well-tube, the liquid outside tends to supply its place, and will supply it in a certain definite time; and if the entire mass of liquid be under the same tension, and equally free to move through the short distance required at the slow rate required, then as liquids are practically inelastic, every drop throughout the whole mass, whether in the interstices of the solid particles or between those particles, will have moved downward through the distance and at the rate required to supply its share of the drop required to replace the one taken from the well. And if the volume of the drop be compared with the total volume of liquid set in motion, and the rate of its movement as taken out be multiplied into the mean horizontal area of the percolator, a good indication is obtained of the almost infinite slowness with which the vertical columns of molecules of the liquid descend through the mass, and the physical laws which govern percolation may be better understood.

The proposition then is to keep the total mass under a uniform tension throughout, and to do this by maintaining a difference in levels between the liquid inside and outside the well; and this difference of levels, which varies with each substance, and with every stage of the percolation of the same substance, is to be maintained by drawing liquid from the well at so slow a rate as to disturb the uniformity of tension throughout the whole mass as little as possible, so as to have the whole liquid in motion at a uniform rate like a slowly descending piston. Of course the simplest way of taking the liquid from the bottom of the percolator is the old often-used stop-cock in an opening in the bottom; but this proves objectionable for several reasons. First, it is difficult though not impossible, by means of a stop-cock at the bottom, to keep the whole mass of matter at a uniform tension, or in uniform maceration. Channels of liquid in more rapid motion are more apt to form, and the packing has to be much more carefully done in order to prevent this tendency to currents in the mass. Next, in actual practice it was found that no stopcock could be arranged to do its work automatically according to the natural requirements and varying conditions of each case. It must be arbitrarily set to run at same rate of dropping that would be decided by the judgment of the operator rather than by the natural conditions and laws of the process. Then

no stopcock could be found which would continue to run at so slow a rate of dropping with any degree of uniformity through so long a time. The smallest particle of solid matter would diminish the rate, or stop it altogether, so that it required to be continually watched or readjusted, and every change that was made disturbed the whole of the delicate balances and motions of the process. Again all the metals of which ordinary stopcocks are made are attacked by the liquids in so long a process, and have the same objection that metallic percolators have. Glass stopcocks were tried, but they were found equally liable to all the objections except the last. This experience led the writer directly to the well-tube, and to the use of a syphon, *f*, as best fulfilling all the conditions required, since it can easily be set lower or higher, to adjust the levels to the desired rate of motion, and having a free flow it works automatically and with certainty. This syphon, *f*, is made of glass tubing of about $\cdot 125$ inch = 3 millimetres bore, bent twice at right angles, the two legs being about $12\cdot 5$ inches = 31 centimetres long. The outer leg is a little longer than the inner one, and turned up upon itself for about $\cdot 750$ inch = 2 centimetres, as shown in the cuts. The legs should have only such a difference in length that the inner one should reach the bottom of the well-tube when required, and when measured upon the outer one, should reach to about midway of the turned up end of the outer leg. This construction prevents the syphon from emptying itself at any time, for, when the liquid is drawn over by the syphon until the surface of liquid in the well-tube falls to a level with the end of the turned up portion, as shown by the lines in the cut of the larger percolator, the columns of liquid in the syphon will be of equal length, and will counterbalance each other, and therefore the flow will cease without emptying the syphon. But as soon as the level of liquid in the well is raised by fresh additions of menstruum on to the substance, the flow will recommence at a rate proportionate to the difference of levels, and may be readjusted to the required rate by slipping it up or down in the cork, *k*, in the upper end of the well-tube. This cork, *k*, should be bored to fit the syphon so tightly as to hold it in any position and should have a groove filed longitudinally on its outer side so as to allow free entrance and exit of air to the well-tube. A receiving bottle, *l*, upon which a strip of paper is pasted to receive any graduation marks that may be desired, completes the apparatus. The strip of paper on the bottle should have the tare of the

bottle in grammes and in grains marked in ink at its lower end, and should then be varnished. Then the graduation marks may be made with pencil, and be rubbed out and replaced as different graduations may be required for different substances, the graduations merely indicating when to try the weight of the accumulating percolate. A wooden stand, *m*, is necessary for the larger percolator to enable the receiving bottle to be conveniently removed and replaced without disturbing the syphon; and wooden blocks, *n*, are necessary to support the receiving bottles at various heights. As a general indication, the rate of dropping from the smaller percolator should be about 6 or 8 drops to the minute, and for the larger one about 10 to 12 to the minute. But it should always be borne in mind that the rate cannot be uniform without some self-feeding arrangement that will preserve a uniform stratum of liquid upon the surface of the substance, and that with such an arrangement, the slower the rate the more perfect, and the more economical the exhaustion will be. With a rate of 2 or 3 drops a minute the results are practically perfect, when the conditions of fineness of powder, and appropriate menstruum are properly fulfilled.

The maceration for, at least, 48 hours is useful for many reasons, chiefly that the adjustment of temperatures and solubility may take place fully and naturally:—that the particles may be thoroughly permeated by the liquid, and the liquid become saturated. And because if the maceration be omitted, the percolate, in many cases, will not be entirely bright or clear. Then as a rule, the longer the maceration within reasonable limits, the stronger will be the percolate that comes next after the maceration,—no matter at what stage of the repercolation the maceration be applied.

When the maceration is completed and the percolation to be started the syphon is put in place with about 3 inches=7.2 centimetres of the inner leg immersed in the liquid of the well-tube. Then the best way to start the syphon is by means of a piece of glass tubing of the same size as the syphon and any convenient length, armed at one end with a short section of rubber tubing of such size as to slip over the end of the turned up part of the syphon easily, but fitting tightly,—or being tied onto,—the end of the piece of glass tubing. The syphon and receiving bottle being now in position to start, the rubber end of the glass tube is passed into the neck of the receiving bottle and down till the rubber slips over the end of the turned up portion of the syphon.

Then by gentle slow suction with the mouth at the upper end of the glass tube the syphon is slowly filled, and when filled the glass tube and rubber are removed. As soon as the dropping commences the syphon must be raised or lowered until the desired rate of dropping is attained. If the syphon has to be raised in order to attain the rate, it must be done little by little in order to avoid raising the inner end out of the liquid in the well. The rate of dropping can only be established with entire uniformity when the inverted automatic feeding bottle is used for supplying menstruum, because when the menstruum is poured on from time to time the dropping will be a little faster as the outside level is raised by each addition.

When weak percolates of diminishing strength are successively used on top, the stratum of liquid should be kept thin, so that each stronger weak percolate may have nearly all sunk into the substance before the next weaker one is used. In receiving the percolate the blocks, *n*, are used to support the receiving bottle in any position, and when the percolation is to be stopped, or made to go very slowly, during the night for example, this may be effected either by raising the syphon higher, or by blocking up the receiving bottle so that the outer end of the syphon is immersed in the percolate received to the necessary depth. Of course when the receiving bottle is blocked up so that the mouth, or any desired mark upon the bottle is near the level of the liquid in the percolator, the bottle can never run over nor the mark so raised be surpassed. The dropping end of the syphon should always be inside of the receiving bottle, because thus all loss by evaporation is avoided, the air inside the bottle being still, and being saturated. If the same rate of slow dropping was carried on outside in the moving air of a room, and the drops fell into a funnel, for example, about one-fourth of the menstruum would be lost by evaporation,—the more volatile portions in greater proportion, and the percolate would be turbid and unfit for use.

The last weak portions of percolate may almost always be pushed through by the careful use of water on top, and in proportion as the operator acquires skill in the management, little menstruum will be lost. When exhaustion is practically complete the syphon is pushed down to the bottom of the well, and the last weak percolate drawn off rapidly.

Then if another portion of the same substance is to be put into the

percolator, the exhausted residue should be so removed as not to disturb the disks of paper and blanket at the bottom.

The principles of this process once well understood, modifications of apparatus will occur to many. The simplest of those that has been tried on a scale larger than the one above shown with lamp chimneys, is to dispense with well tube and syphon, and replace them with a piece of rubber tubing of small bore. One end of this is placed between the two disks of flannel near the centre of the percolator, and then the tubing is led up through any part of the packed substance,—say near, but not against the side of the percolator, as this would leave channels for liquid,—and then out over the edge of the percolator. Then a small bent portion of glass tubing is slipped into the end of the rubber so as to represent the end of the glass syphon. This end can then, by the flexibility and length of the rubber tube, be kept at any desired position. This however does not answer as well in practice as the well and syphon, nor does any other yet tried, including the simplification adopted with the lamp chimneys,—answer as well, when judged by the results obtained.

The writer made a conditional promise at the request of the Committee that he would give a table showing his own practice with fluid extracts in regard to the menstruum now used for each,—the weight of a pint of the menstruum and the weight of a pint of the finished fluid extract in each case, as bearing upon the proposed new relation of making them weight for weight instead of minim for grain, and the work for constructing such a table has been done. But this paper has grown to such an unreasonable length that it will hardly be read, and the calculations and construction of the table would require so much additional time that the writer must beg the Committee to excuse him for not presenting it.

The writer was rather opposed to the new relation of weight for weight when this point was discussed by the Committee, but now considers it practicable if the labor be given to make it fairly accurate; and believes that it might be made far more accurate than the present relation of minim for grain, this latter having proved to be rather an ideal than a practically true relation.

Brooklyn, April 16th, 1878.

On the GLUCOSIDE CHAMÆLIRIN, the BITTER PRINCIPLE of the CHAMÆLIRIUM LUTEUM, Gray.

By FRANCIS V. GREENE, M. D., U. S. N.

Read at the Pharmaceutical Meeting, April 16, 1878.

In the Unofficial List of the U. S. Dispensatory the Chamælirium luteum is briefly described under its old name of Helonias dioica, and mention made of its having been found useful in colic, and likewise efficacious in the treatment of leucorrhœa and atony of the generative organs. The American Dispensatory, the standard text-book of the "Eclectics," edited by John King, M. D., in addition to giving a more detailed description of the Helonias dioica and pointing out the difference between it and the Aletris farinosa, which is often mistaken for it, and used in its stead, states that its root possesses the properties of a tonic, diuretic and anthelmintic; that in large doses it produces emesis, and that, when fresh, it acts as a sialogogue. The most interesting point, however, in connection with this root is its reputed action as a uterine tonic, and in consequence of this supposed property of removing abnormal conditions and imparting tone to the reproductive organs, it has been somewhat extensively used, with reported success, not only in the treatment of leucorrhœa, amenorrhœa and dysmenorrhœa, but also to correct the tendency to repeated abortion. That the chamælirium does really act as a uterine tonic is corroborated by the testimony of Dr. Braman ("Boston Med. and Surg. Journ.," xi, 416) and still more recently by that of E. H. Woodbury, M. D. ("Southern Medical Record"), who makes a very favorable report of its value in the treatment of leucorrhœa, amenorrhœa and dysmenorrhœa. With the exception of a short notice in Tilden's Supplement to the "Journal of Materia Medica," the above references embody everything of importance that is known in regard to the therapeutic action of this plant. No chemical investigation appears to have been made, and, as we are entirely ignorant of the nature of the principle or principles which produce the observed effects on the economy, an inquiry in this respect seemed desirable, not only in consequence of its therapeutic action, but likewise on account of the plant being so closely allied botanically to the veratrums, with which it was originally classed by Linnæus, under the name of the *V. luteum*. I have therefore lately examined the the root of Chamælirium luteum, and have succeeded in extracting from it in a pure state quite a large amount of a very bitter substance, of a

light buff color, which proves to be a glucoside, and which I propose to call *chamælinin*, to distinguish it from helonin, the so-called neutral substance of the "Eclectics," which, according to King, is merely a "hydro-alcoholic extract" of the *Helonias dioica*.

In making this examination, in the first instance four troyounces of the powdered *chamælinium* root were exhausted with cold distilled water, the filtered solution placed on a water bath, evaporated to one-half its bulk, calcined magnesia added, and the evaporation continued until the mass was dry, when it was powdered, and extracted with several portions of ether. On evaporating the ethereal solution, there remained a small quantity of a white substance, which was amorphous, and insoluble in water, acids and ammonia, but readily soluble in alcohol. The mass which had been exhausted with ether, was then extracted with absolute alcohol, and the solution, which was of a light yellow color, filtered. After the evaporation of the alcohol, there remained a light yellow, transparent, resinous matter, having an intensely bitter taste, and which dissolved completely in water. The aqueous solution was found to be quite neutral, and did not give any reactions with the ordinary tests for the alkaloids, with the exception of phosphomolybdic acid, with which it gave a flocculent yellowish-white precipitate. Boiled with Fehling's solution, it however quickly reduced the copper. A small quantity of an aqueous infusion of the root was then added to the test solution, and boiled, when the copper was converted into the red oxide, showing conclusively that glucose existed in the root.

Believing that with care in drying the magnesia mass thoroughly, the bitter principle could be extracted free from glucose, or if not, with the intention of removing it from the alcoholic solution by the addition of the proper amount of ether, eight troyounces of the finely powdered root were exhausted with water, the filtered solution treated as before with magnesia, evaporated to dryness, the mass powdered, again heated on the water-bath, and then placed in a warm closet for some hours. The bitter principle was then extracted with hot absolute alcohol; the filtered solution was evaporated, and yielded 20 grams of the bitter principle which, tested with Fehling's solution, proved to be entirely free from glucose. The magnesia mass was then treated with hot distilled water, and the filtered solution evaporated to dryness with a little magnesia, and this mass again extracted with absolute alcohol. On evaporating the alcohol, 2.65 grams more of the bitter substance were obtained.

The sum of the two extractions amounting to 350 grains, it follows that 9.1 per cent. of chamælinin had been extracted, so that, making allowance for the root not having been probably thoroughly exhausted, and for unavoidable loss, it is safe to conclude that the root contains fully 10 per cent. of the bitter principle. The mass remaining after the extraction by absolute alcohol, was then exhausted with hot alcohol of 70 per cent. To this solution, after cooling and filtering, an equal volume of ether was added, which caused the precipitation of a molasses-like liquid which, treated with Fehling's solution, gave the appropriate reaction for glucose.

Distilled water was then added to the whole of the bitter substance, but as it agglutinated after the manner of gum arabic, heat was applied, which caused it to dissolve rapidly, although the quantity was so small as to give the clear solution a syrupy consistence. On diluting the solution with water, it was noticed that as the liquid cooled it became slightly turbid. It was therefore still further diluted, and set aside for twelve hours, when it was found to have deposited a small quantity of a white substance, which, separated by filtration, dissolved in hot water, alcohol and ether, but not in acids or alkaline solutions. A small quantity of this substance dissolved in ether, gave upon evaporation the same white, opaque film that was observed in the case of the substance dissolved out of the magnesia mass by ether in the first experiment.

As the filtrate from this white substance was still slightly cloudy, animal charcoal was added to it, and after agitation, it was filtered, yielding a perfectly clear solution. The use of the charcoal proved in the first place that the white substance is retained by it, and secondly that it does not remove any of the color from the chamælinin. Subsequent experiment showed that the use of the charcoal was not essential, as by proper dilution, and allowing sufficient time for subsidence, the solution can be filtered off perfectly free from the white substance, provided that the washings are not added to it as the insoluble matter passes through the pores of the filter when pure water is added. Another and still better plan of overcoming the difficulty, occasioned by the presence of this substance, is to take advantage of its solubility in ether, and by using this menstruum to remove it from the magnesia mass before exhausting with absolute alcohol.

The clear solution of chamælinin was then evaporated to dryness on a water-bath, yielding an opaque, amorphous mass of a light buff

color. It is very readily reduced to a powder, which is very much lighter in color than the substance in mass. This powder adheres to the fingers after the manner of a resin. As may be gathered from the method of extraction, chamælinin is freely soluble in hot and cold water and alcohol. It is insoluble, or only very sparingly so, in ether, and quite insoluble in chloroform, petroleum benzin, benzol and bisulphide of carbon. The solid substance gives no play of colors when brought in contact with sulphuric, nitric or hydrochloric acids. When, however, sulphuric acid is added to a small quantity, in a test tube, at the moment of contact a ruby-red color is produced, which soon disappears, as the substance is quickly charred by the acid. Treated similarly with nitric acid, it dissolves in it, giving a clear canary-yellow solution, which does not change by standing. Hydrochloric acid dissolves it, the solution gradually assuming a beautiful wine or peach-red color; the liquid, however, becomes turbid after a short time. Its solution in acetic acid is colorless. It does not afford any play of colors with Fröhde's reagent, but dissolves in it with a yellowish-brown color. It is freely soluble in ammonia; but strong solutions of the fixed alkalies precipitate it from its solution. It is also precipitated by an excess of a solution of caustic baryta. It has no effect whatever on test papers. It is not precipitated from its solution by either tannic acid or acetate of lead, and affords no precipitates with potassio-mercuric iodide, iodine in iodide of potassium solution, potassio-cadmie iodide or metatungstic acid; it does, however, give a yellowish-white precipitate with phosphomolybdic acid, which dissolves in ammonia with a blue color, that disappears on heating. It does not reduce the cupric to the cuprous hydrate, even after prolonged boiling with the test solution. A small portion of the substance, boiled with dilute hydrochloric acid, neutralized with bicarbonate of soda, and then added to Fehling's solution and boiled, quickly reduced the copper, showing that it is a glucoside. The dilute acid splits it up into glucose and an insoluble body, the examination of which has not been completed.

The aqueous and alcoholic solutions of chamælinin froth in the same manner as those of saponin, which renders it probable that it is very similar to the last-named substance and the other glucosides that have the same property. Its free solubility in cold water, and its behavior with the mineral acids prove, however, that it is not identical with any of these bodies.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

The Free Acids of the Gastric Juice.—By repeated treatment of gastric juice with ether, Ch. Richet has separated an acid which was recognized as identical with *sarcolactic acid*, prepared from horse-flesh; its zinc salt resembles the corresponding salt with the ordinary lactic acid (obtained by fermentation), but the calcium salts of the two acids differ in crystalline form; however, the sarcolactate, when kept for some time, assumes the aspect of the ordinary lactate of calcium, probably by a change in hydration. The ether also took up small quantities of fatty acid; the nature of the acid insoluble in ether will be investigated by the author.—*Jour. de Phar. et de Chim.*, Feb., 1878, p. 109.

Iodide of starch, according to Bondonneau, is always a definite compound, having the formula $(C_{12}H_{10}O_{10})_5I$ ($O=8$). To obtain it pure, soluble starch is prepared by acting with caustic soda upon starch diffused in 15 to 20 times its weight of water; after slightly acidulating the solution, a solution of iodine is added in slight excess and the precipitate well washed with water, acidulated with HCl, and dried at the ordinary temperature.

It is in hard pieces, of a violet-black color and coppery lustre. It swells in water, and when diffused in it appears blue. At $100^{\circ}C$. it loses 16 to 18 per cent. (H_2O and HI), becomes carbonized and is not decolorized by sulphite of sodium; the loss is increased to 46 per cent. by heating to $190^{\circ}C$. ($374^{\circ}F$.), and the black residue then contains 2 to 3 per cent. of iodine. When heated with water, in a sealed tube, it is gradually, almost completely converted into glucose and hydriodic acid. A similar conversion, including dextrin and an iodated organic compound, is produced by diastase and by saliva. The iodine is dissolved by alcohol, but not by potassium iodide, benzin, sulphide of carbon or other solvents. Iodide of starch contains 13 per cent. of iodine, a portion of which is slowly eliminated by drying over sulphuric acid—*Ibid.*, p. 121.

Oil of tansy consists, according to Bruylants, of a small quantity, (about 1 per cent.) of hydrocarbon $C_{10}H_{16}$, four-fifths of an aldehyd, *tanacetyl hydrid*, $C_{10}H_{16}O$ and of an alcohol $C_{10}H_{18}O$. The aldehyd is best separated by sodium bisulphite. Two resins were also found, one of which had the behavior of an acid.—*Jour. de Phar. et de Chim.*, Nov., 1877, p. 393.

Proximate Principles of Lobelia Inflata.—Wm. H. D. Lewis obtained the alkaloid in a pure state by exhausting the herb with very dilute acetic acid, concentrating the infusion, treating with magnesia and agitating with amylic alcohol, on the spontaneous evaporation of which lobelina remains behind. It may be further purified by dissolving in water, passing through animal charcoal, which retains it, and dissolving it by ether or amylic alcohol. It is light yellow, of the consistence of honey, has a somewhat aromatic odor and a sharp acrid taste, and is soluble in all simple solvents, sparingly in petroleum naphtha. It is decomposed by caustic alkalies and cannot be distilled. Exposed to the air, it slowly resinifies. H_2SO_4 colors it red-brown, the color being intensified by potassium bichromate. Fröhde's

reagent has the same behavior. Continued boiling with dilute H_2SO_4 liberates glucose; dilute potassa has the same result.

Lobelic acid is obtained by precipitating the decoction with sulphate of copper, decomposing by H_2S , evaporating and exhausting with hot ether; on evaporation a yellow crystalline mass is left, which is purified by dissolving in cold ether. The acid is not volatile and dissolves in ether, alcohol and water, the aqueous solution being precipitated green by copper sulphate, brown by ferric chloride, yellow by lead acetate, dirty-white by mercuric nitrate, and white, becoming red-brown, by silver nitrate. The *lobelacrin* of Enders ("Pharmacographia," p. 357) is regarded by the author to be lobelate of lobelina.

The aqueous distillate of the plant possesses the odor, but not the acrid taste of lobelia. Reinsch's *lobeliin* is evidently a very indefinite compound, and possibly contains traces of lobelina.—*Phar. Jour. and Trans.*, Jan. 19, p. 561.

Solubility of Sugar in Water.—H. Courtonne confirms the results, previously obtained by Berthelot and Scheibler, that 100 grms of water dissolve at $12.5^\circ C$. ($54.5^\circ F$.) 198.647, and at $45^\circ C$. ($113^\circ F$.) 245 grms. of sugar. A solution, therefore, saturated at $12.5^\circ C$. contains 66.5, and when saturated at $45^\circ C$., 71 per cent. of sugar.—*Compt. Rend.*, lxxv, p. 959.

Ointment of thymol has been used by Balmanno Squire for ringworm; it was prepared by melting thymol ζi at the temperature of a water-bath and mixing it with lard ζi . When of this strength, the ointment did not produce irritation of the skin or any other evil effect.—*Phar. Jour. and Trans.*, Feb. 2, p. 602.

Thymol and its Pharmacy.—Thymol is produced from several labiatæ, principally from *Thymus vulgaris*, *Monarda punctata* and *Ptychotis ajowan*. It is in nearly transparent and colorless irregular crystals, sp. gr 1.028, of a burning and aromatic taste. It fuses at about $44^\circ C$. and often remains liquid for several days or until brought in contact with a crystal. It is freely soluble in alcohol, ether, chloroform, benzol, carbon bisulphide, oils and in potassa and soda; it dissolves sparingly in water, glycerin and ammonia. Ether, shaken with the alkaline solutions, removes the thymol entirely.

A. W. Gerrard found that the strongest aqueous solution of thymol available is 1 in 1,000. 4 grains of it dissolved in a fluidounce of rectified spirit will yield an alcoholic solution miscible with water without becoming turbid. 1 grain dissolved in 2 fluid drachms of heated glycerin remains clear on cooling, the solution becoming turbid on the addition of water until four volumes of the latter have been added, when it is clear again. 1 grain of caustic soda dissolves 3 grains of thymol and 1 grain of potassa $2\frac{1}{2}$ grains of it; the solutions remain clear when diluted with water. Fats and oils are excellent solvents of thymol, but require to be heated to insure perfect solution. Vaseline is not an eligible basis for it, the thymol crystallizing upon the surface of the mixture.—*Ibid.*, Feb. 16, p. 645.

Commercial Oil of Thyme.—A. W. Gerrard attempted to prepare thymol from the oil by agitating it with soda solution, but obtained variable quantities of an oily liquid differing from thymol. When placed in ice the oils did not separate any

crystalline matter. This leads to the inference that the thymol must be extracted in the countries where the oil is produced, and that the residual cymene and thymene is sold as oil of thyme.—*Ibid.*, p. 646

Garcinia indica, known in India as *Kokum*, flowers about Christmas and ripens its fruit in April and May. Dymock states that the fruit is largely used as an acid ingredient in curries as is an article of commerce in the dry state. It is generally prepared by removing the seeds, drying the pulp in the sun and slightly salting it. The seeds are pounded and boiled to extract the fat, which is roughly moulded by hand into egg-shaped balls or concavo-convex cakes, and is known as kokum-butter. The apothecaries of Goa prepare a very fine purple syrup from the fruit, which is worthy of attention.—*Phar. Jour. and Trans.*, Jan. 19, p. 565.

Elemic Acid.—In addition to bryoidin and amyrrin, Eugene Buri has separated a third crystalline principle from elemi. It is obtained from the mother liquors of amyrrin ("Amer. Jour. Phar.," 1876, p. 355), by evaporating them. The amorphous resin is dissolved in petroleum spirit (60°C. boiling point), the solution becomes turbid with more petroleum spirit. The mixture is shaken with potassa solution, and after separation the jelly is emulsionized by the addition of some water, and then dissolved in ether. Instead of petroleum spirit, ether may be used for dissolving the resin. On supersaturating the alkaline solution with HCl, elemic acid is precipitated and freed from an amorphous acid resin by repeated crystallization from alcohol. Its composition is $C_{35}H_{56}O_4 = (C_5H_8)_7O_4$. The potassium salt crystallizes from its strong alkaline solution in needles.—*Ibid.*, Feb. 2, p. 601.

Spurious balsam of tolu has been observed by W. A. H. Naylor. It is yellowish-brown, very viscid, in thin layers of golden yellow and transparent; has a somewhat glue-like odor, and when tasted produces in a few seconds a sensation of warmth and acidity. It is completely soluble in carbon bisulphide, benzol, chloroform, ether and hot alcohol, the latter solution depositing on cooling. Glacial acetic acid and potassa solution dissolve it partly. It contains no constituent volatile at 160°C, and when distilled with potassium bichromate and sulphuric acid, no oily liquid passes over, and the odor of bitter almonds is not evolved. Agitated with ammonia and the filtrate acidified with dilute sulphuric acid, a pink color is quickly developed. It was free from fixed and volatile oils, and found to consist of an indifferent and two acid resins. The author suggests the probability that this substance is a natural product of new importation, and not a tampered or manufactured article.—*Ibid.*, Feb. 9, p. 624.

Artificial Vanillin.—Tiemann has patented a process in England which depends upon the conversion of eugenic acid into aceto-eugenol by boiling with acetic anhydrid. The newly formed compound is treated with a very weak warm solution of potassium permanganate, the solution filtered, rendered slightly alkaline, concentrated, acidulated and the vanillin extracted with ether.—*Ber. Deutsch. Chem. Ges.*, 1877, p. 1907.

Distillation of Resins with Zinc Dust.—This was effected by G. Ciamician in a current of hydrogen, and the products separated by fractional distillation. *Abietinic acid* yielded under these circumstances toluol, C_7H_8 , meta-ethylmethylbenzol C_9H_{12} ,

naphthalin, $C_{10}H_8$, methylnaphthalin, $C_{10}H_{11}$ and methylanthracen, $C_{15}H_{12}$. *Colophony* yields the same products, but toluol in much smaller proportion. *Resin of benzoin*, freed from extraneous matter and benzoic acid, similarly treated, yielded toluol, xylol, naphthalin and methyl naphthalin.—*Ibid.*, 1878, 269.

Cubebin, $C_{10}H_{10}O_3$, according to H. Weidel, is by nitric acid converted into oxalic and picric acids, while it yields, with nitrous acid, small yellow crystals of $C_{10}H_9(NO_2)O_3$, which are soluble in ether, alcohol, ammonia and potassa; the latter solution having a purple color. If cubebin is dissolved in chloroform, and bromine added, drop by drop, $C_{10}H_7Br_3O_2$ separates, which is insoluble in the common solvents, and obtained in white crystals from boiling xylene. When fused with HKO, carbonic, acetic and protocatechuic acids are obtained; the same products were yielded, under similar circumstances, by ferulic acid and eugenol, into which compounds, however, cubebin could not be converted.—*Wien. Akad. Ber.*, lxxiv, p. 377.

Medicinal Plants of Liberia.—E. M. Holmes describes the following: *Ocimum viride*, Willd., nat. ord. *Labiata*, fever plant, is a shrub, three feet high, with ovate, lanceolate acuminate leaves, 1 to 2 inches long, crenate at the margin and abundantly dotted underneath with oil glands. It has a strong odor like lemon thyme, and possibly contains thymol. Dr. Roberts states that in Liberia it is the common remedy for fever of any kind, and that he has entirely substituted it for quinia in his practice, since it is much cheaper and equally as effectual. It is given in the form of infusion in wineglassful doses until perspiration is freely induced, the patient being kept warm in bed.

Aspilia latifolia, O. & H., nat. ord. *Compositæ*, hæmorrhage plant, is an herb $1\frac{1}{2}$ to 4 feet high, with the leaves opposite, very rough, ovate, acuminate, minutely serrate and very hard to the touch, being covered with short rigid hairs; the flowers are yellow, with neuter ray florets and almost obsolete pappus. The fresh leaves and flowers are pounded together and applied to the wound, the hæmorrhage stopping in a few minutes and the wound healing rapidly without other application. The decoction, in doses of $\mathfrak{z}\text{ss}$ 3 times a day, is used in hæmorrhage from the lungs.

Cassia occidentalis, Lin., nat. ord. *Leguminosæ*, small senna.¹ The leaves are used in Liberia as a purgative. Larger leaves, probably of a *Croton*, are known there as *large senna*.

Scopariadulcis, Lin., nat. ord. *Scrophulariaceæ*, pipybras. The plant is used for gravel and kidney complaints, in the form of infusion.

Erythrophlœum guineense, Don. Sassybark is used only as a poison. (See "Amer. Jour. Phar.," 1877, p. 32.)—*Pharm. Jour. and Trans.*, Jan. 19, p. 563.

Detection of Adulterations of Butter.—All animal fats, with the exception of butter, consist of tristearin, tripalmitin and triolein, and therefore yield between 95.23 and 95.73 per cent. fatty acids, while pure butter yields between 85.4 and 86.2, occasionally 87.5 per cent. O. Hehner regards butter as adulterated if it yields

¹The plant has been naturalized in the Southern United States.—EDITOR.

over 88 per cent of fatty acids. The determination is made by fusing the butter and freeing it completely from water, salt and casein; about 4 grms. of it are then completely saponified by alkali in the presence of alcohol, the solution of soap is concentrated, the residue taken up in about 150 grms. of water, decomposed by muriatic acid and the fatty acid washed, dried and weighed.—*Zeitschr. Anal. Chem.*, xvi, 145.

Husson dissolves the butter in 10 times its weight of a mixture of equal parts of 90 per cent. alcohol and ether at a temperature of 35 to 40°C. (95 to 104°F.). The solution is set aside for 24 hours at a temperature of about 18°C. (64.4°F.) and the separated solid fat, of which pure butter yields not over 40 and not less than 35 per cent, is collected and weighed. If more than 40 per cent., the butter is adulterated with tallow or suet; if less than 35 per cent., lard, goose grease or similar fats are present.—*Jour. de Phar. et de Chim.*, Sept., 1877, p. 100.

Preparation of Indigo Carmine.—V. Joëlét gives the following process: 1 kilo of powdered good Bengal indigo is gradually added to 5 kilos of strong sulphuric acid, heated in a water-bath to 45 to 50°C. (113 or 122°F.). When dissolved, the liquid is poured into a suitable vessel, and for every kilo there is slowly added a solution of 3k of clear crystallized sal sodæ dissolved in 30k. of water. The mixture is occasionally stirred during 12 hours to facilitate the extrication of the carbonic acid gas, set aside for some time, and then passed through a woollen filter, the filtrate being collected. The contents of the filter are transferred to a vessel with an inner perforated bottom, upon which a woollen strainer is placed, and more indigo carmine solution obtained and withdrawn by means of a stopcock. Finally indigo purple remains upon the filter.—*Chem. Cent. Bl.*, No. 10, *D Färber-Z.*, 1877.

Preparation of Phosphorous Acid.—I. Corne recommends to partly immerse phosphorus in distilled water, and after several days' exposure precipitate the phosphoric acid from the liquid by the addition of ammonia, ammonium chloride and magnesium sulphate. The filtrate is heated to expel excess of ammonia, and then mixed with acetate of lead, whereby sulphate, chloride and phosphite of lead are precipitated. The precipitate is well washed and, at a moderate heat, digested with ammonium acetate, whereby the two former salts are dissolved, while the lead phosphite remains behind, and after washing is decomposed by sulphuretted hydrogen. The solution is filtered, heated to expel H_2S , and now contains pure phosphorous acid.—*Jour. de Phar. et de Chim.*, Feb., 1878, p. 100.

Persulphuric acid, S_2O_7 , is a new acid, which has been obtained under the influence of electricity upon a mixture of dry sulphurous acid gas and oxygen; it crystallizes at a low temperature in transparent needles. It may also be obtained in the form of solution by carefully mixing chlorine water with concentrated sulphuric acid, but is not formed if the latter contains more than 2 equiv. of water. Under various conditions the new acid may be obtained from concentrated sulphuric acid, perhaps also by acting with the latter upon alkaline or metallic peroxides in the cold.—*Ibid.*, March, 1878.

Santonin.—The fusing point of santonin is given by the French Codex at $136^{\circ}\text{C}.$, by the German Pharmacopœia at $170^{\circ}\text{C}.$ H Leroy has examined commercial santonin and such prepared by himself, and found both kinds to have the fusing point $170.5^{\circ}\text{C}.$ ($339^{\circ}\text{F}.$)—*Rép. de Phar.*, March, 184.

Hydrobromate of quinia has been used with success in whooping cough, the paroxysms diminishing in frequency and severity in about a week. Dr. Steinitz ordered 0.3 to 0.5 grms. of the salt to 100 grms. of syrup to be given in teaspoonful doses every two hours.—*Allg. Med. Cent. Zeitung.*

Tasteless tannate of quinia is obtained by A. Bernick by mixing 20 parts of sulphate of quinia with 600 parts of distilled water, having a temperature of 60 to $70^{\circ}\text{C}.$ (140 to $158^{\circ}\text{F}.$), and carefully adding dilute sulphuric acid, with the precaution to leave a few floccules of the quinia undissolved. To this is slowly added, and with continued stirring, a cold prepared solution of 60 parts of tannin in 600 parts of distilled water. The precipitate is collected upon a filter, washed with 100 parts of distilled water, and dried upon bibulous paper at the ordinary temperature. The yield is 70 parts. The filtrate contains a little tannin, but not a trace of quinia. The process is a modification of the one adopted by the German Pharmacopœia.—*Phar. Zeitung*, No. 30.

Curarina, the poisonous alkaloid of curare, according to Sachs, has the composition $\text{NC}_{36}\text{H}_{35}$, and is present in the form of sulphate.—*Liebig's Annalen*, vol. 191, p. 254, Feb., 1878.

Apomorphia, of English manufacture, was found by Patrouillard to be a voluminous powder of grey color, intermixed with blackish granules. Under the magnifying glass it appeared as glossy scales. It has a slightly bitter taste, is soluble in water, alcohol and ether, and is colored dark-red to violet by nitric acid, the color becoming gradually lighter and the mixture sticky, but thin again and brown on the addition of ammonia. Ferric chloride colored it rose-red, the color changing to violet and finally black. The aqueous solution yields with solution of iodine a red precipitate which dissolves on heating and colors the solution red, afterwards brown. The aqueous and alcoholic solutions of the alkaloid are at first colorless with a greyish tint, but on exposure to the air become greenish and finally emerald-green.—*Zeitschr. Oester. Apoth. Ver.*, No. 9, from *Jour. de Phar. et de Chim.*, 1877.

Adulterated lard has been met in the German market by E. Heintz, and was found to contain 22 per cent. of water. The lard was imported from two firms in Amsterdam and was branded "E. Milnor & Co., New York." The author believes that the adulteration was made in Holland.—*Phar. Zeitung*, No. 30.

Application for Sore Nipples.—Dr. Haussmann, of Berlin, recommends a 5 per cent. solution of carbolic acid, which is applied lukewarm by means of linen.—*Ibid.*

Administration of Creasote.—Tournier recommends cod liver oil for masking the caustic taste of creasote and facilitating its digestion. He gives it in capsules containing .02 gm. ($\frac{1}{50}$ grain) mixed with .50 gm. ($7\frac{1}{2}$ grains) of cod liver oil. To be given by the spoonful, this solution should be more dilute, so as to contain 1

grm. of creasote to 150 grms. of cod liver oil. He also recommends a *wine of creasote* made by dissolving 6 grms. of creasote in 125 grms. of alcohol, and adding 400 grms. of simple syrup and sufficient Malaga wine to make 1 liter. This is weaker, but preferable to that made by Bouchard's formula, which contains in the same measure 135 grms. of creasote and 30 grms. of tincture of gentian, but no syrup.—*Rép. de Phar.*, 1878, p. 98.

Oil of rose geranium, *Pelargonium rosatum*, according to Jaillard, is freely soluble in 70 per cent. alcohol. Since the fixed and most volatile oils which may be used for adulteration are sparingly soluble in that liquid, they may be readily detected by mixing in a test tube 6 drops of the suspected oil with 5 cubic centimeters of 70 per cent. alcohol. After agitation the solution must be complete.—*Jour. de Phar. et de Chim.*, March, 206.

To Detect Cotton Fibre in Linen.—The fabric is well washed, dipped into an alcoholic solution of rosolic acid, known in commerce as aurin or yellow corallin, afterwards immersed in a concentrated aqueous solution of sodium carbonate and finally washed; the linen fibre is dyed rose-red by this treatment, while cotton remains white.—*Phar. Zeitung*, No. 18—*Polyt. Notizbl.*

Impressions from Plants.—A piece of paper is saturated with oil, folded to 4 thicknesses and subjected to great pressure to facilitate the uniform absorption of the oil. The plant or leaf is now placed between the oiled paper, moderately pressed, then removed to clean paper and again pressed. This last paper is afterwards dusted over with finely powdered plumbago or, better still, with a mixture of rosin and plumbago; on warming the paper with the adhering latter admixture a permanent impression is obtained.—*Apotheker. Zeit.*, No. 9—*Industriebl.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, April 16, 1878.

In the absence of the President, Mr. Wm. McIntyre was called to the chair; the minutes of the last meeting were read and approved. Prof. Maisch corrected a statement he had made at the last meeting in regard to the tincture of protochloride of iron, and said that it was made official in the German Pharmacopœia of 1872, and prepared by dissolving 25 parts of the recently prepared protochloride of iron in 225 parts of diluted alcohol (sp. gr. 0.892), adding 1 part of pure hydrochloric acid, and filtering.

Prof. Maisch presented from Dr. F. V. Greene, U. S. N., a specimen of oil of Tucumã (from the *Astrocayum tucumã*), also a specimen of the oil of Batiputã (*Gomplia parviflora*, *Mart.*), both from Brazil. The former appears not to be employed medicinally, but the fruit is eaten by the Indians, and the fibres of the plant possess great tenacity. The latter is used in place of olive oil and medicinally as an embrocation in rheumatism and erysipelas.

A paper by Mr. Alonzo Robbins upon *Maté*, the *Ilex Paraguayensis*,¹ was read and samples of the different commercial varieties of the drug were exhibited. Remarks were made upon the uses of *maté* and of the North American *yaupon* tea (*Ilex cassine*, *Lin.*) The patient labor bestowed by Mr. Robbins upon his researches was commented upon, and on motion the thanks of the meeting were directed to be returned to the author.

A member reminded the meeting that various committees of the College were now engaged in the preliminary revision of the Pharmacopœia, and a typical formula was exhibited, showing the manner in which the formulas were proposed to be reported. The formula shown was for *Confectio Opii*.

Take of Opium in very fine powder,	3 parts
Aromatic Powder,	37 "
Clarified Honey,	60 "
	<hr/>
	100 parts

Parts by weight in all cases are designated.

The advantage of this manner of representing the formulas was evident, as the ratio of the active ingredient to the entire amount is seen at a glance, the quantity resulting being exactly 100 parts.

A paper by Dr. F. V. Greene, U. S. N., was read on *chamelirin*, a bitter, neutral glucoside, isolated by the author from *Chamelirium luteum*, Gray. Samples of the rhizome of this plant and of *Aletris farinosa*, *Lin.*, were exhibited, both of which are sometimes called *blazing star*, a name more generally applied to *Liatris squarrosa* Willd. The extremely bitter new glucoside was likewise exhibited, and its behavior to various solvents and reagents illustrated. On motion, a vote of thanks was tendered to Dr. Greene for the interesting communication.

A paper upon Emulsions, by Mr. L. von Cotzhausen, was then read; the various processes described were illustrated by samples of the results of the different formulas, some of the emulsions being two months old. This paper elicited a great deal of comment, several members detailing their experience with the different processes.

An inquiry was made regarding the preparation of pills of salicylic acid by compression, the inquirer relating the difficulty he experienced in freeing perfect pills from the press. Prof. Remington ascribed the difficulty to the dryness and non-adhesiveness of the material, and mentioned that the addition of a small quantity of powdered soap, exposure to a damp atmosphere by placing in a tight box which has been filled with steam from boiling water, rubbing the end of the plunger and lower die with paraffin, oftentimes would remedy the difficulty.

Prof. R. called attention to a plan for preserving prescriptions which he had used with great satisfaction, and referred to a contrivance for the same purpose, designed by W. H. Naulty, Little Rock, Ark., which, however, he had not yet seen. He uses Mann's Binder; the prescriptions may be either temporarily or permanently

¹The papers by Mr. Robbins and Mr. Cotzhausen will be published in the June number.—EDITOR.

bound, and the facility with which reference may be had in case of renewals amply repays the small expense and the use of the long brass-wire file, which always mutilates and affords no protection from dirt, dust and flies. When permanently bound the prescriptions have the appearance of regularly bound volumes.

Prof. Maisch exhibited a number of seeds, which when polished and mounted have been quite popular as "charms"; they are known as "sea-beans," because they are washed ashore on the coast of Florida and other States on the Gulf of Mexico; they are yielded by a tree which is indigenous to the West Indian islands. The seeds are known in Cuba as *Ojo de buey*, or bull's eye, but the "ox eyes" noticed by Grisebach are very different. A recent writer in the "Scientific American" said that the sea-beans were the product of *Cytisus arboreus*, of Sloane; but the plant noticed by De Candolle under this name is a native of Algeria.¹

There being no further business, a motion to adjourn was carried.

T. S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alumni Association of the Massachusetts College of Pharmacy.—At the monthly meeting, held March 7, Prof. Babcock gave an account of his recent visit to the Bahama Islands, and exhibited a large number of seeds and other vegetable products, among them the so-called *sea-bean*, or *black-eyed Susan* (see above). He showed a letter written two months previous with the red juice of the *prickly pear*, the fruit of the cochineal cactus, and said that it would be interesting to ascertain what relation, if any, existed between the coloring matter of the juice and that of the insect which feeds upon the branches of the cactus. He described the *banyan*, or *wild fig*, with its numerous aërial roots growing from the branches and having the appearance of trunks; also the *vegetable sponge*², so-called from the entangled fibres of the fruit, which is shaped like a cucumber, the fibres being a poor substitute for the sponge; also the *sand-box*, being the fruit of a large tree³ shaped like a tomato, and when ripe bursting with a loud report and throwing the seeds to quite a distance. He exhibited specimens and described the products of the *arnatto shrub*⁴, the *cowage bush*⁵ and many useful fruits growing there, among the latter one called *archee*, or *arkee*, containing a pulpy substance, eaten by the negroes, black kidney-shaped seeds and a peculiar juice, which is used as an indelible ink; it is yellow when first applied, but rapidly becomes darker and is very permanent.

A vote of thanks was tendered to Prof. Babcock for his very interesting and instructing discourse.

¹ The so-called *sea-bean* undoubtedly comes from *Mucuna altissima*, D. C., the fruit and seed of which are described in Grisebach's "Flora of the West Indian Islands" as follows: "Legume 6 inches long, 1½ inch broad below its pointed top, callous on the margins, rusty, hirsute. Seeds orbicular compressed, 8 to 10 lines diam., almost wholly surrounded by the rhaphe. Hab. Jamaica! *Wils.* rare, in mountain woods, Manchioneel (French islands; Panama! Brazil.)—EDITOR.

² *Luffa spec.* ³ *Hura crepitans*, *Lin.* ⁴ *Bixa orellana*, *Lin.* ⁵ *Mucuna pruriens*, *Lin.*—EDITOR.

At the meeting held April 4, Mr. Sheppard introduced the subject of the growing habits of physicians to prescribe non-official and proprietary articles; in the discussion it was urged that efficient and equally elegant preparations should be made official, or prepared by the pharmacists for their use.

Mr. Sheppard gave a brief history of the patented articles cosmoline and vasaline, and similar preparations of the so-called *neutral oils* of the petroleum products. He stated that Mr. Chas. Toppan, of Wakefield, Mass., had at last succeeded in obtaining a similar article without infringing on any patent. It is made by throwing the heavy residue left in the still, the same material from which the articles mentioned are made, in the form of spray, into a current of live steam; the resulting product, which has but a very slight petroleum odor, is made by the Binghampton Oil Refining Co., of Binghampton, N. Y., and can be furnished for about 25 cents a pound.

Mr. Sheppard also exhibited some specimens of *pure wax*, one made by direct heat, the other by the aid of a water-bath, the latter being much lighter and handsomer; 75 lbs. of comb honey had yielded only 1 lb. 9 oz.

The subject of *coating pills* extemporaneously was introduced by Mr. Kelley; the meeting did not favor a coating of tolu, as being insoluble in the fluids of the stomach.

In some remarks on making *dialyzed iron* it was stated that Mr. Lowd uses as a dialyser a glass lamp shade, and Mr. Kelley an inverted glass funnel.

National College of Pharmacy, Washington, D. C.—At the annual meeting, held in April, the usual routine business was transacted and the following officers were elected for the ensuing year, viz.:

President, John A. Milburn; Vice-Presidents, J. S. Jones and J. R. Major; Secretary, Chas. Becker (Georget'n); Treasurer, W. G. Duckett; Additional Trustees, Messrs. Cromwell, O'Donnell, DeMoll, Scala, Thompson, Fill and Lewis. Messrs. Oscar Oldberg, W. S. Thompson and R. B. Ferguson were elected delegates to the Pharmaceutical Convention of 1880.

The Georgia Pharmaceutical Association held its third annual meeting in Augusta on the 9th of April, President R. H. Land in the chair, and W. A. Taylor Secretary. Mr. H. P. Tarrant, on behalf of the druggists of Augusta, extended a hearty and cordial welcome, which was responded to by Mr. Th. Schumann, of Atlanta. A large number of members were elected, after which the reports of the officers and committees were read and disposed of, and the following officers elected for the ensuing year:

President, O. Butler, Savannah. Vice-Presidents—H. P. Tarrant, Augusta; J. M. Madden, Brunswick; J. W. Jaynes, Rome. Treasurer, John Ingalls, Macon. Secretary, Walter A. Taylor, Atlanta.

Resolutions of regret were passed relating to the death of Dr. J. A. Taylor, the first that has occurred since the organization of the society amongst its members.

The afternoon session was taken up by the address of Mr. J. A. Polhill and by discussions on a pharmacy law, a draft of which had been submitted at the morning session. At the evening session, nominations were made for the proposed State Pharmaceutical Board, a number of papers were read, and a committee appointed to perfect arrangements for the twenty-sixth annual meeting of the American Pharmaceutical Association to be held at Atlanta in September next. Mr. Isidore Zacharias was chosen as the next orator, and Savannah as the next place of meeting, and after various resolutions of thanks the meeting adjourned.

On the next day the members enjoyed an excursion up the great canal, and upon their return were made the recipients of an elegantly prepared dinner.

Cincinnati College of Pharmacy.—The commencement exercises were held at College Hall on Thursday evening, March 21st, when the President, Mr. George Eger, conferred degrees on the following gentlemen:

Henry Bertrams, Cincinnati; Alex. Colvard, Illinois; L. Dressel, Cincinnati; M. Gleick, Cincinnati; Frederick A. Grossman, Ohio; Henry Heister, Cincinnati; N. G. Hildreth, Ohio; Aug. J. Hofling, Cincinnati; Jno. H. Koenig, Kentucky; Jno. F. Kutchbauch, Ohio; Chas. A. Mohr, Alabama; Leo S. Schreck, Mexico.

Addresses were delivered by Prof. John A. Murphy, M.D., of the Miami Medical College, and by Prof. E. S. Wayne.

The prizes were then awarded as follows: for pharmacy, by Prof. Fennel, a prescription desk balance, to N. G. Hildreth; the Alumni medal for general proficiency, and Prof. Wayne's gold medal for proficiency in botany and materia medica, to Chas. A. Mohr; the chemistry prize, a complete set of blow-pipe apparatus, by Prof. Judge, to Leo S. Schreck.

A life-size portrait, in oil, of Prof. Wayne was presented to the College by Mr. Hofling, on behalf of the graduating class. Mr. F. A. Grossman then read the valedictory, which concluded the exercises.

The Alumni Association of the Cincinnati College of Pharmacy held their annual meeting on Wednesday, March 20th, 1878. After the new members from the graduating class had been received into the association, the following officers were elected for the ensuing year:

President, Louis Heister. Vice-Presidents—August Hofling, Herman Wilfert. Recording Secretary, Theodore Bange. Corresponding Secretary, Albert Wetterstroem. Treasurer, Robert M. Kuerze. Executive Board, for one year—G. A. Fieber, M. Gleick, Theo. Pellens, C. M. Greve; for two years—E. A. Schmidt, E. T. Harley. Delegates to Pharmaceutical Association—Jos. H. Feemster, C. P. Rendigs, Louis Schwab, R. M. Kuerze, C. M. Greve.

The association will hereafter meet on the first Tuesday of every third month, for the discussion of scientific subjects relating to pharmacy and its collateral branches. On Thursday evening, March 21st, after commencement exercises, the Alumni gave a reception at the Highland House in honor of the graduating class, in which dancing and other amusements were indulged in.

St. Louis College of Pharmacy.—The Twelfth Annual Commencement of the St. Louis College of Pharmacy, and the Third Annual Reception of the Alumni Association, took place on Monday evening, March 18, at Germania Club Hall. The President, Charles Bang, conferred the degree of Graduate in Pharmacy on the following gentlemen: John F. Barker, California; Chas. E. Smith, Indiana; David J. Holfbauer, Missouri; A. G. Behrens, G. E. Bœhlan, Chas. T. Gasewisch, David S. Green, Wm. P. Gulick, Peter Hoffmann, G. Kern, G. R. Mullhal, J. I. Murray, A. R. Mynders and Wm. S. Ondyn, all of St. Louis.

The Valedictory Address on the part of the Faculty was delivered by Professor Otto A. Wall and on the part of the class by Chas. E. Smith. At the Alumni Reception, President Francis Hemm delivered the address of welcome and awarded the Certificates of Membership. The Alumni Prize, a silver medal, was awarded to Mr. D. F. Gasewisch, the most proficient in all the branches taught. An address by Wm. C. Balm closed this part of the exercises and was followed by a grand hop, which concluded the entertainment.

Pharmaceutical Society of Great Britain.—At the Pharmaceutical Meeting of March 6, Mr. Harold Senier read a paper on *croton oil*. Referring to the observations of Pereira, Redwood and Warrington (see "Am. Jour. Phar.," 1850, p. 218, and 1865, p. 191), the author confirms the statement that croton oil becomes more soluble in alcohol by age; absolute alcohol and spirit of sp. gr. .838 dissolved 20 per cent. of freshly-expressed oil, 40 per cent. when three months old, 55 per cent. when three years, and 60 per cent. when over three years old. The portion insoluble in alcohol, when applied to the skin, produced no effect whatever, but the soluble portion, after the evaporation of the alcohol, was exceedingly active. The latter, at 32°F., has the consistence of butter, at 50° is too viscid to flow, at 60° has the sp. gr. .987, is reddish-brown with a slight fluorescence, the characteristic odor and of turbid appearance from suspended acicular crystals, which are soluble on slightly warming the oil. Heated to 460°F. by itself, and to 360°F. with hydrochloric acid or strong potassa solution, the oil does not appear to lose any of its activity.

Prof. Redwood referred to his experiments, made about 30 years ago, when he found all English-pressed croton oils to be perfectly soluble in an equal bulk of absolute alcohol, the solution separating, however, when cooled to between 30° and 40°F. At that time Dr. Paul, while engaged in the process of grinding the seeds, suddenly became insensible, the effects upon him being narcotic in character, and not accompanied by purging and irritation.

Prof. Bentley alluded to the possibility that both a vesicating and a purgative principle would be found in croton oil; the former was called crotonol by Schlippe, but has not been obtained by any other chemist; the latter has never been isolated, and is in some degree connected with the purgative principle of castor oil, which is said to be an acrid resinous substance, but has likewise not been isolated.

Mr. Umney stated that at present all the croton oil of Great Britain was pressed by one firm only.

Mr. Gerrard said that the croton oil now in use at the University College Hospital had been there five years, and, from the fact that physicians continued to prescribe the minim dose, he thought it might be inferred that age did not increase the activity of the oil. Mr. Holmes, however, thought that if the increase of the soluble portion was due to the production of resinified oil, it would necessarily follow that the oil would be more purgative.

Mr. E. M. Holmes read a paper on *Duboisia Myoporoides*, R. Br., a shrub or small tree, which is a native of Eastern Australia, New Caledonia and New Guinea. Its leaves are alternate, shortly stalked, quite smooth and entire, lanceolate, 3 to 4 inches long and about an inch broad in the middle. It has very small pale lilac or white flowers, arranged in terminal paniced cymes, and produces a small succulent berry-like fruit. Its didynamous stamens make it related to the scrophulariaceæ, but on account of its regular corolla it is now placed in the solanaceæ. The extract of the leaves closely resembles atropia in its action; the active principle has not been isolated, but the aqueous extract has been used in Sydney and Brisbane, and found to be more prompt and energetic than atropia, and certainly very much more so than the strongest extract of belladonna.

At the pharmaceutical meeting held April 3, Mr. John Williams read a paper on *salicylic acid*. The author had prepared this acid from oil of wintergreen, and exhibited samples of it, the neutral portion of the oil and the methylic alcohol separated from the acid. In comparing this natural salicylic acid with that artificially made, considerable differences were observed; one drachm of the former was found to require three ounces of boiling water to effect complete solution, the latter two or even only one and a half ounces. On adding to these concentrated solutions one fifth alcohol and allowing to cool, the natural acid will crystallize in separate, distinct crystals, while the artificial will form a network of fine needles, or the lower grades a woolly-looking mass. The artificial salicylic acid was dissolved in boiling water, and neutralized by carbonate of calcium; on cooling, salicylate of calcium is deposited, and after several recrystallizations, when decomposed by hydrochloric acid and recrystallized from weak alcohol, yields salicylic acid absolutely identical with the natural acid. The uncrystallizable mother-liquor from the calcium salicylate, on being decomposed by hydrochloric acid, yields silvery plates of an acid quite distinct from salicylic acid, and more soluble in hot and cold water than the latter, also more than paraoxybenzoic acid. Its solution with perchloride of iron does not give a yellow precipitate, characteristic of the last-named, but gives the so-called characteristic reaction of salicylic acid, probably due to not being entirely free from it. The quantity of this new acid, for which the name of *cresyl-salicylic acid* is for the present proposed, is estimated at from 15 to 25 per cent. of the artificial acid. The author will continue his investigations.

Mr. Plowman stated that the artificial salicylic acid given in doses of 20 grains every two or three hours had frequently caused delirium, but although it sometimes appeared to derange the system, at the same time it had the required effect of lowering the general temperature.

Mr. E. M. Holmes read a paper on *Grindelia robusta*. Referring to the observa-

tion of Prof. Maisch (February number, p. 87), and after examining the drug as imported into Great Britain, he concludes that it is not *G. robusta*, Nutt., but *G. squarrosa*, Dunal. The following characters are given for roughly distinguishing the species for pharmaceutical purposes: *G. squarrosa*—leaves narrowly lanceolate, tapering downwards to a small cordate base so that the upper portion of the leaf is broadest; scales of the involucre subulate and strongly curled backwards. *G. robusta*—leaves oblong, broadest at base, obtuse, and nearly twice the width of the preceding; scales of the involucre similar but less squarrose. *G. integrifolia*—leaves entire but very sparingly serrated, more tapering at apex and longer than the preceding. *G. inuloides*—leaves nearly as broad as those of *robusta*, oblong, wider at the base, and furnished with short closely set more obtuse teeth; the flower heads almost immersed in large leafy bracts. *G. glutinosa*—leaves lanceolate, tapering to the base, broader than the first; scales of the involucre linear, short-pointed and erect. *G. rubricaulis* (*G. hirsutula*)—stem purplish, involucre hairy, upper leaves larger at the base, lower leaves tapering towards the stem.

Mr. A. W. Gerrard read a paper on the *alkaloid and active principle of Duboisia myoporoides*. It was prepared by diffusing the aqueous extract in water, precipitating with alcohol, evaporating the filtrate, diluting with water, adding ammonia and agitating with chloroform. The alkaloid is a yellow viscous mass, freely soluble in alcohol, chloroform, ether, benzol and carbon bisulphide, fairly soluble in water and imparting to it a decided alkaline reaction. It was not obtained crystalline, and of its salts only the sulphate and hyrobromate crystallized in needles. It is very similar in its reactions to *atropia*, but differs from it in being more soluble in water, to require more acid for neutralizing, and to yield, when boiled with baryta, an unpleasant odor, while *atropia* by the same treatment gives off a pleasant odor reminding of gaultheria. With strong sulphuric acid in the cold, *atropia* remains unaffected, but on heating the mixture it darkens, evolving a pleasant aromatic odor, which the addition of potassium bichromate intensifies and at the same time yields a green precipitate of chromium oxide and vapors of an acid reaction. *Duboisia* alkaloid gives with sulphuric acid in the cold a reddish-brown color and when heated an odor unpleasant and suggestive of butyric acid; upon the addition of potassium bichromate, no reduction to the oxide was apparent, but the evolved vapor was of acid reaction. In its physiological action, the alkaloid was found to entirely agree with *atropia*.

Dr. Paul confirmed the statements as to the amorphous condition of most of the compounds. A note had been received from Mr. A. Petit, of Paris, giving similar results and stating that the aqueous solutions of the alkaloid were fluorescent and dichroic, being yellow by transmitted and blueish green by reflected light.

Dr. Bancroft, of Brisbane, who discovered the properties of *duboisia*, stated that the watery extract was equal, weight for weight, to *atropia*, and the physiological action of the two alkaloids would probably not be found identical.

Pharmaceutical Society of Paris.—At the meeting of February 6, a note by Mr. Carles was read, communicating the *analysis of citron juice*, which resulted as follows: free citric (and malic) acid 5.77, supercitrates of potassium .96, of calcium

·88 and of iron ·11, glucose 2·45, gummy and albuminoid matters ·68, phosphates and other salts ·06 and water 89·09.

Mr. Stan. Martin presented a branch of *Satia tabernæmontana*, nat. ord. apocynaceæ, a shrub growing in rocky places, near the Senegal, where its root is used in elephantiasis.

Mr. Plauchud communicated the results of his observations in relation to the *decolorization of solution of litmus*; it is caused by the presence of organized and living germs, which, while developing, do not seem to act alike energetically.

Mr. Yvon reported on the application of glycerin in the preparation of certain oleo-stearates (like mercury), which are decomposed by contact with water.

At the March meeting a note by Mr. Ch. Tanret was read, in which he recommends, when testing for small quantities of *glucose in urine*, to precipitate the latter first with nitrate of mercury, and, without filtering, to add an excess of caustic soda before testing with Fehling's solution; if inosite be present a slight green precipitate takes place, but a decided precipitate of cuprous oxyde in the presence of but little glucose. Some albuminous matter in the urine interferes with the prompt action of Fehling's test liquid.

Mr. Yvon described the preparation of *iodide of ethyl (hydriodic ether)*. He recommends the process of Personne and uses a tubulated retort, which is placed in a sand bath and has the neck connected with a receiver, which is plunged in cold water. 5 grams of phosphorus and 60 grams of alcohol are introduced into the retort, 20 grams of iodine are now added, and after a few minutes 20 grams more. Heat is carefully applied, care being taken that the whole of the liquid is uniformly heated, which is facilitated by the introduction of some pieces of platinum. With this precaution the liquid boils slowly, without concussions, and distils completely. The distillate may be colorless or colored by iodine; it is agitated with an aqueous solution of an alkaline carbonate, decanted, rectified and dried by a second distillation over calcium chloride. This last operation is indispensable for the preservation of the ether. To prevent the presence of free iodine, some silver foil is placed into the ether.

EDITORIAL DEPARTMENT.

THE present number of the "Journal" opens with an exhaustive article by Dr. Squibb on a subject of great importance to the pharmacist. Notwithstanding its length, it was deemed but just to the author, as well as to the readers, that it should appear undivided. Although this number has, like the preceding one, been increased from 48 to 64 pages, we have been compelled to reserve for the June number several original essays, letters and translations, and would embrace this occasion to thank our contributors and ask their indulgence at the delay of publication.

Naval Apothecaries.—The following letter explains itself:

To the Editor of the Journal of Pharmacy:—I desire to call the attention of pharmacists to a bill now before Congress, giving the rank of "Warrant Officers" to the apothecaries of the navy. Should

it become a law, the office of a naval apothecary will become very desirable, both in pay and position and the office should be filled by thoroughly competent men. The duties involve clerical as well as pharmaceutical work, and some knowledge of dentistry and minor surgery.

This would be a splendid field for "Graduates in Pharmacy," and no one who is not a graduate, or who cannot pass as *thorough a pharmaceutical examination*, should be admitted to the corps. Now is the time for the Colleges of Pharmacy and the American Pharmaceutical Association to take action in this matter; memorialize the Secretary and Surgeon-General of the Navy in favor of the Graduate of Pharmacy, request a *rigid pharmaceutical* examination for apothecaries, etc., etc. The present incumbents, as a rule, are very badly educated, poor pharmacists, having only "shop knowledge," and many are intemperate and ignorant of pharmacy. Let *all* have a fair chance before an examining board, and there is little doubt the "graduates" would fill the 60 or 80 appointments that will have to be made under the law.

I trust, Mr. Editor, you will keep this subject before the pharmacists of the country until some decided action is taken thereon. As the appointments will be for life, with retiring pay and pensions in case of disability, it is all-important that no time be lost in looking after this matter. MEDICUS.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Chemical Experimentation, being a hand-book of lecture experiments in Inorganic Chemistry, systematically arranged for the use of lecturers and teachers in chemistry, as well as for students in Normal Schools and Colleges and for private study. By Samuel P. Sadtler, A.M., Ph.D., Assistant Professor of Chemistry in the University of Pennsylvania. Louisville: John P. Morton & Co. 8vo, pp.225.

The work before us supplies a want which, we think, has been felt by most teachers of chemistry; it contains descriptions of a very large number of experiments, suited for the lecture room, and illustrating chemical reactions and the physical properties of the elements and their inorganic compounds. The descriptions are accurate and full, but free from prolixity, and can readily be followed by those having a general knowledge of chemical manipulations, even if not experienced in chemical experimentation; and this use is greatly facilitated by 139 excellent cuts, illustrating with exactness and precision the arrangement of the requisite apparatus. Moreover, the number of experiments described is so large that the teacher will find the book a useful aid for selecting such as may require either simple or more complicated apparatus. The author may therefore very properly express the hope that by its use "the teaching of chemistry might be sufficiently facilitated as to allow its introduction as a branch of study in many schools, where as yet it has been excluded or very greatly slighted." For the same reasons it will also be welcomed by those students who desire to repeat the experiments seen in the lecture room or to vary them with the aid of simpler apparatus.

The author has carefully abstained from the discussion of theoretical questions, the experiments being regarded as practical demonstration of facts; the work may therefore be used as a supplement to any good text-book on chemistry.

In recommending the book to teachers and to students in chemistry, we do so from the belief in its intrinsic worth, and when we state that its typographical execution is excellent, we regard this fact as a very acceptable addition to the other merits.

Fourteenth Annual Report of the Alumni Association, with the exercises of the fifty-seventh commencement of the Philadelphia College of Pharmacy. Philadelphia, 1878. 8vo, pp. 63.

The title-page of this pamphlet makes the erroneous statement that the commencement of March last was the *forty-seventh* of this College, while in point of fact lectures have been delivered annually without interruption since 1821, so that the course last closed was the *fifty-seventh* held in that institution. The introductory lecture at the opening and the valedictory delivered at the close of that course, the annual address to the alumni by Dr. A. W. Miller, an account of the transactions at the reception tendered to the last graduating class, minutes of the annual meeting and of the executive board, together with officers' reports and a list of the graduating class, comprise the contents of this pamphlet, which the alumni of the college may obtain by addressing Wallace Procter, 900 Lombard street, vice president of the association.

Proceedings of the Western Wholesale Drug Association, in convention at Louisville, Ky., Feb. 13 and 14, 1878. Cincinnati: Printed at the Aldine Printing Works. Pp. 45.

This association was organized at Indianapolis in 1876 (see "Am. Jour. Phar.," 1876, p. 233). Its objects, as expressed in the preamble to the constitution, are—"to create a permanent social feeling between the wholesale druggists of the West—to obliterate the feeling of distrust and jealousy that seems to exist—to correct excessive and unmercantile competition—to remove, by concert of action, all evils and customs that are against good policy and sound business principles—to establish rules and regulations that all differences and grievances may be fairly and equitably adjusted." The objects, it must be admitted, if faithfully carried out, would redound likewise to the benefit of the retail trade; and after carefully reading the proceedings we must say that the decided stand taken in the reports presented against inferior quality of goods, and in favor of honorable dealing, merits the support of the intelligent pharmacist, as it concerns likewise the wholesale trade. We need not leave the large cities to notice the ruinous competition in the sale of well-known articles, aiming, like the higgler on the street, at catching customers by excessively low prices for such articles, and charging extortionate rates for others the value of which cannot be judged by the purchaser. Credit in business, adulteration of drugs, some of the follies of the Wood tariff bill now before Congress, received due attention, and the convention finally adjourned to meet at Chicago next year on the second Wednesday of November.

The officers for the present year are: President, A. Peter, Louisville; Vice Presidents, C. F. G. Meyer, St. Louis; Jas. S. Burdsal, Cincinnati; Geo. A. Kelly, Pittsburg; D. R. Noyes, St. Paul, and Wm. Letterer, Nashville; Treasurer, S. M. Strong, Cleveland; Secretary, J. W. Plummer, Chicago. There was also appointed a board of control, and committees on price lists and circulars, on credits, on commercial travelers, on legislation, drug market, membership, fire insurance, proprietary goods and on adulteration of drugs.

The Multum in Parvo Reference and Dose Book. By C. H. Leonard, M.A., M.D.
Third edition. Detroit, 1878. 16mo, pp. 100. Price, bound, 75 cts.

The little book may be conveniently carried in the vest pocket and contains a good deal of information of value to the physician. We were rather surprised to find it contain a list of nearly a hundred elixirs and ever so many pills, evidently copied from the price lists of manufacturers. Such space, in our opinion, might have been occupied with more useful and more important information.

Sur la Composition des Cloportes. Par Dr. C. Méhu. Paris, 1878.
On the composition of hoglice (woodlice).

Two species, *Oniscus asellus* and *O. armadilla*, Lin., are still recognized in the French Pharmacopœia, and to some extent employed by the people mainly on account of their diuretic properties. The second species is found in commerce; after drying completely it was found to contain 44.46 per cent. of organic compounds, and of the remaining inorganic constituents 2.26 per cent. were soluble and 33.28 insoluble in water. The first species, dried, left 34.1 per cent. mineral residue on incineration. The author very properly argues in favor of dismissing these little crustaceæ from the Pharmacopœia.

Chemische Beiträge zur Pomologie, mit Berücksichtigung der livländischen Obstcultnr.
Von Dr. G. Dragendorff. Dorpat, 1878. 8vo, pp. 102.
Chemical contributions to pomology, with reference to the fruit culture of Livland.

This is a very creditable work, undertaken with the view of promoting the culture of apples in the western part of Russia.

Botanischer Congress (Abtheilung Chinarinden) und Ausstellung pharmaceutisch wichtiger Pflanzenproducte zu Amsterdam, im April, 1877. Von Prof. Ed. Schaer in Zürich. Pp. 21.

Botanical Congress (section cinchonabarks) and exhibition of pharmaceutically important vegetable products at Amsterdam, April, 1877.

We regret that we cannot make room for a translation of this interesting essay. A portion of the exhibit of cinchonas, we judge, was the same that had been at the Centennial Exposition and of which we have given an account before ("Am. Jour. Phar.," 1876, p. 323).

Die Deutsch-Amerikanische Gewerbe- und Industrie-Zeitung: Fortschritt der Zeit.

The German-American Industrial Gazette: Progress of the Age. R. A. Koss, editor. W. W. Coleman, publisher. New York and Milwaukee. Monthly. Price, 75 cents per year.

About a year ago the two German periodicals, the Gazette and Progress of the Age, were consolidated, and since that time have appeared under the united title given above. We believe that this is the only paper covering the field of industrial sciences, inventions and discoveries, which is published in the United States in the German language; and we notice that preparations are being made to issue it semi-monthly after a few months.

We acknowledge the receipt of the following investigations from the laboratory of the Pharmaceutical Institute at Dorpat :

Werthbestimmung des Wismuths und des käuflichen Magisterium Bismuthi. Von Jul. Löwy.

Valuation of bismuth and its commercial subnitrate.

Beiträge zur Ermittlung einiger Hopfensurrogate im Biere. Von Wilh. Meyke.
On the recognition of some substitutes for hops in beer.

Rhabarber Analysen. Von Dragendorff.
Analysis of rhubarb.

Ein Beitrag zur Kenntniss der Mutterkorn-Alkaloide. Von Theod. Blumberg.
On the alkaloids of ergot.

We likewise acknowledge the receipt of the following pamphlets :

Descriptive and Statistical History of Tobacco. By E. H. Gilmore. Washington, D. C., 1878. Price, 25 cts.

Annual Review of the Drug Trade of New York for the year 1877. Prepared by D. C. Robbins. New York, 1878.

Bathing, Cupping, Electricity, Massage, etc. By David Prince, M.D. Reprint from the "American Practitioner," Feb., 1878.

Proceedings of the Louisiana State Medical Association, etc. New Orleans, 1878.
This State Association was organized at New Orleans in January last.

Medicinal Plants indigenous in Michigan. By A. B. Lyons, M.D. Pp. 25.
The paper was read before the Detroit Academy of Medicine.

OBITUARY.

DANIEL HENCHMAN, probably the oldest apothecary in the United States, died in his native city, Boston, April 13, at the advanced age of 88 years. Born in 1790, he purchased the lot where he carried on business in 1814, and erected a store and dwelling house, which is still standing. The lower floor was originally divided into two stores, one of which was occupied by Mr. Henchman, and enlarged by the addition of the other store when this was vacated by its first tenant. In this place the deceased carried on the drug and apothecary business for 63 years, and the store even to this day presents an ancient appearance. In it may be seen long rows of old-fashioned plain-blown glass jars, capped with tin covers, painted green and ornamented with quaint and elaborate labels, consisting of grotesque figures, scroll-work and letters in gilt and yellow. Several shelves are filled with earthen jars of various shapes, and decorated after the style known to pottery dealers as "flowing blue." The only modern embellishment was a small Tuff's soda fountain.

The deceased was one of the early presidents of the Massachusetts College of Pharmacy, and during his life-time held many offices of honor and trust, the duties of which he discharged with that faithfulness and strict integrity which marked all his acts, public and private. We well remember the meeting of the American Pharmaceutical Association of 1865, when we met the deceased for the first time, and the peculiar fascination of listening to his vivid descriptions of customs and occurrences of half a century ago. Requiescat !

THE AMERICAN JOURNAL OF PHARMACY.

JUNE, 1878.

MATÉ, OR PARAGUAY TEA.

BY ALONZO ROBBINS, PH.G.

Read at the Pharmaceutical Meeting, April 16, 1878.

Ilex Paraguayensis, Yerba Maté, or Paraguay Tea, is a small tree belonging to the family of the Celastrineæ. Under the name of maté the prepared leaves of this tree have been employed as a beverage in South America from the earliest period, and in some portions of that country even now, to the almost entire exclusion of China tea. Maté having attracted considerable attention in Europe within the last few years, the writer embraced the opportunity afforded by the Centennial Exhibition to obtain authentic specimens, which were exhibited by the government of the Argentine Republic, and furnished by the provincial commission and private individuals of the province of Corrientes and the adjoining territory of the Missions in that republic. Although maté is but little known and of comparatively small importance in this country, its immense production and use in South America renders it deserving of greater attention than has been hitherto given to it. As several papers more particularly referring to its general use and commercial importance have been recently published, the direction of this paper will be principally confined to its proximate composition and the difference therein which the several samples may show.

According to Dr. Mantegazza, maté is prepared as follows: The entire trees are cut down, and the small branches and shoots are taken with the leaves and placed in the *tatacúa*, a plot of earth about six feet square, surrounded by a fire, where the plant undergoes its first roasting. From thence it is taken to the *barbacúa*, which is a grating supported by a strong arch, underneath which burns a large fire; here it is submitted to a particular torrefaction, determined by experience, which develops the aromatic principle. Then it is reduced to a coarse powder in mortars formed of pits dug in the earth and well rammed.

It is next put into fresh bullock skins, well pressed, and placed in the sun to dry. Other writers have given accounts of its preparation differing in the minor points, but all agreeing in the main.



ILEX PARAGUAYENSIS, Sc. Hil.

Flowering branch and gourd infusion pot.

The following is a description of the samples and their history so far as it was possible to ascertain it :

No. 1. Exhibited by M. Vera ; packed in bag made of wolf skin, weight about 4 kilos, color bright greenish-yellow, odor not as aromatic as some of the other samples, almost entirely free of twigs, and appears to have been prepared from very young leaves dried with little if any artificial heat.

No. 2. Exhibited by T. B. Appleyard ; size of package and general appearance and character of this sample very much like No. 1.

No. 3. Exhibited by I. Arrillaga ; weight about 8 kilos, packed in the entire skin of a tapir ; this maté was rather coarse, containing many twigs, some of which were charred slightly ; color a dull brownish-green, odor very aromatic and balsamic. This sample is believed to have been prepared by the Guarani Indians of the northern part of the Missions.

No. 4. Exhibited by the Provincial Commission ; weight 15 kilos, packed in the entire skin of a tapir, general appearance and character of this sample like No. 3.

No. 5. Exhibited by the Provincial Commission ; weight 10 kilos, packed in the entire skin of an animal. This sample was very unevenly powdered, and much of it quite coarse ; it also contained a large proportion of twigs somewhat charred, and much sand ; in color it resembled No. 4 ; the odor was also similar to that sample, but much weaker ; its general appearance indicated the most primitive mode of preparation. This sample was from the department of Itaty on the Parana.

No. 6. Exhibited by the Provincial Commission ; packed in small skin bag, weighing 3 kilos. This maté was coarsely powdered, very dark in color, odor quite aromatic and balsamic, and contained many fruits and twigs. It was also from Itaty.

No. 7. Exhibited by the Provincial Commission ; packed in skin bag, weighing 65 kilos. This maté was finely powdered, of a bright color, aromatic odor, and contained only a small proportion of twigs. This sample was from the northern part of the territory of the Missions, which furnishes the most celebrated maté. This territory is formed by that part of the extinct empire of the Jesuits, which was inherited by the Argentine Republic. Among the forest trees which grow admirably in the Missions that which produces the Yerba Maté merits a special mention. Near the river Uruguay it forms extensive

forests, which are the source of a most important industry, whose principal centre is in the Villa de San Xavier.

The appearance and character of the samples indicate that there are at least three sorts of powdered maté. First, that made from the young leaves; samples Nos. 1 and 2 appear to be of this sort. Second, that prepared by the original primitive method of the natives, and which exceeds both of the other kinds in aromatic properties; of this sort Nos. 3, 4, 5 and 6 appear to be samples. Third, that prepared with more care and with the aid of modern furnaces for its torrefaction, and mills for its pulverization; of this sort No. 7 appears to be a sample.

The following experiments were all performed with the utmost care, the method of examination adopted was uniformly applied to all the samples, the air-dried maté was in each case powdered and kept in a well stoppered bottle, to be drawn from as required. The results shown by the first table were obtained by subjecting 10 grams of maté to the separate action of each of the different solvents and processes as there shown. The results shown by the second and third tables were obtained by treating 10 grams of maté successively with the solvents in the order there given, the difference being that in the second table the maté is last treated with boiling water, and in the third table that solvent is the first to which it is subjected.

TABLE No. I.

10 grams of Maté treated separately with	SAMPLES.						
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Boiling water,	3'37	3'65	3'52	3'17	3'09	3'31	3'16
Petroleum benzin, . . .	0'58	0'45	0'41	0'57	0'36	0'45	0'41
Chloroform,	0'90	0'75	0'71	0'89	0'51	0'66	0'73
Alcohol, sp. gr. '822, . .	3'05	3'62	3'83	3'12	3'01	3'24	3'26
Alcohol, sp. gr. '941, . .	3'49	3'77	3'84	3'23	2'98	3'33	3'36
Tannin,	1'55	1'60	1'60	1'60	1'28	1'00	1'30
Caffeína,	0'03	0'02	0'06	0'10	0'08	0'16	0'14
Total ash,	0'65	0'58	0'55	0'50	1'09	0'73	0'64
Ash soluble in water, . .	0'18	0'15	0'20	0'16	0'12	0'17	0'18
Ash insoluble in water, .	0'47	0'44	0'35	0'34	0'94	0'56	0'47
Ash soluble in HCl, . . .	0'36	0'40	0'32	0'31	0'53	0'44	0'40
Sand,	0'11	0'04	0'03	0'03	0'41	0'12	0'06
Moisture in air-dry Maté, .	0'75	0'85	0'80	0'75	0'62	0'75	0'71

TABLE II

10 grams of Maté successively treated with	SAMPLES.						
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Petroleum benzin,	0.58	0.45	0.41	0.57	0.36	0.45	0.41
Chloroform,	0.22	0.24	0.22	0.27	0.21	0.25	0.22
Alcohol, sp. gr. .822, . . .	1.57	2.32	2.49	1.70	1.78	1.90	2.02
Alcohol, sp. gr. .941, . . .	2.12	1.82	1.87	1.84	1.81	1.73	1.68
Boiling water,	0.27	0.24	0.21	0.22	0.20	0.25	0.24
Ash,	0.32	0.38	0.29	0.24	0.92	0.40	0.38

TABLE III.

10 grams of Maté successively treated with	SAMPLES.						
	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Boiling water,	3.37	3.65	3.52	3.17	3.09	3.31	3.16
Petroleum Benzin,	0.59	0.50	0.53	0.61	0.40	0.43	0.46
Chloroform,	0.16	0.17	0.16	0.20	0.15	0.17	0.19
Alcohol, sp. gr. .822, . . .	0.39	0.44	0.52	0.48	0.38	0.31	0.41
Alcohol, sp. gr. .941, . . .	0.19	0.17	0.32	0.18	0.29	0.16	0.21
Ash,	0.36	0.36	0.31	0.28	0.92	0.44	0.40

Treatment with Boiling Water. Table No. I.—10 grams of powdered maté were boiled half an hour with 100 cc. of water, the decoction poured off, and the process repeated four times with the same quantity of water; the decoctions were mixed, filtered, and evaporated on a water-bath to dryness. The extract obtained was of a brown color in mass, yellow in powder, of slight odor and mild bitter taste. It contained caffeina, tannin, gum, starch and pectin.

The extract yielded to boiling water by 10 grams of maté after treatment as in Table No. II, was, when powdered, of the color of unburnt umber, inodorous and tasteless; it consisted principally of starch and pectin.

Treatment with Petroleum Benzin. Table No. I.—10 grams of pow-

dered maté were exhausted by percolation with petroleum benzin, and the benzin allowed to evaporate spontaneously; the result was a thick greenish black oily extract; the exhausted maté after drying was free of the benzin odor, and retained but little of its own natural odor; the extract after a long time was not entirely free of the odor of the benzin. This extract was found to contain chlorophyl, resin, wax and fatty matter, and probably a small quantity of volatile oil, though none could be separated; it contained no tannin or caffeine.

After the preparation of a fluid extract of maté by percolation with alcohol, sp. grav. '941, the residue was dried and 1,000 grams of it exhausted by percolation with petroleum benzin; upon spontaneous evaporation of the percolate 43 grams of dark green extract remained; a portion of this having the consistence of castor oil was separated, and a thicker portion, which adhered to the bottom of the dish, was washed with aqua ammoniæ as long as it removed anything, and then washed with dilute hydrochloric acid. There now remained 3.70 grams of a black mass, very adhesive and elastic, and burning with the well-known odor of caoutchouc. This experiment proves that the substances soluble in petroleum benzin are not removed from maté by alcohol of the specific gravity '941, and a comparison of the figures in the petroleum benzin line in the tables also shows that boiling water fails to remove the same substances.

Treatment with Chloroform, Table No. I.—10 grams of powdered maté were percolated with chloroform until exhausted, and the chloroform evaporated spontaneously; the extract obtained was of a soft waxy consistence, fragrant odor and dark green color; it contained wax and fatty matter, chlorophyl, resin and caffeine, but no tannin.

The extract obtained by chloroform from 10 grams of maté after treatment as in Table No. II, was pulverulent, of a dark green color and slight fragrant odor; it contained resin and caffeine, but no tannin.

The extract yielded to chloroform by 10 grams of maté after treatment as in Table No. III, was pulverulent, of a grayish olive color, and almost odorless; it contained resin and chlorophyl, but no tannin or caffeine.

Treatment with Alcohol, sp. grav. '822, Table No. I.—10 grams of powdered maté were exhausted by percolation with alcohol, and the alcohol driven off on a water-bath. The extract obtained was of a soft consistence, heavy narcotic odor, and deep green color; it con-

tained fatty matter, chlorophyl, resin, tannin and caffeina. A portion of the residue of the maté, after percolation with alcohol, was dried and percolated with petroleum benzin; the percolate was colorless, and upon evaporation no extract whatever was obtained, proving that alcohol of sp. grav. .822 dissolves all the constituents of maté which are soluble in petroleum benzin. Another portion of the residue from percolation with alcohol was percolated with chloroform; a brownish-green percolate was obtained, which upon evaporation yielded a small quantity of hard, green, wax-like matter, readily fusible, and when burnt giving off the odor of caoutchouc.

The extract yielded to alcohol by 10 grams of maté after treatment with petroleum benzin and chloroform as in Table No. II, was of a soft consistence, greenish brown color in mass, and transparent bright yellow color in thin layers, the odor fragrant and very agreeable, the taste bitter and acrid; it contains resin and tannin, but no caffeina.

The extract obtained by alcohol from 10 grams of maté after treatment with boiling water, petroleum benzin and chloroform, as in Table No. III, was of a dark green, almost black, color, easily powdered, yielding a pale greyish-green powder, nearly inodorous, and of a slight bitter taste; it contained tannin, but was entirely free from caffeina.

Treatment with Dilute Alcohol, sp. grav. .941, Table No. I.—10 grams of powdered maté were exhausted by percolation with dilute alcohol and the resulting tincture evaporated to dryness on a water-bath. The extract obtained was of a brown color, readily powdered, yielding a light yellow powder, of slight odor, and bitter, astringent taste; it contained resin, caffeina and tannin.

The extract yielded to dilute alcohol by 10 grams of maté after treatment as in Table No. II, was of a dark brown color, readily powdered, yielding a brownish-yellow inodorous powder, of slight bitter, astringent taste; it contained tannin and gum, but no caffeina.

The extract obtained by dilute alcohol from 10 grams of maté after treatment as in Table No. III, was of a light brown color in mass, dull yellow when powdered, inodorous and almost tasteless, the presence of tannin shown, but it was entirely free of caffeina and resin.

Tannin.—For the estimation of the tannin the following process was employed (for additional details of similar process, see Proceedings of the American Pharmaceutical Association, 1876, page 513, and

"American Journal of Pharmacy," 1877, page 388.) Of each sample of maté, finely powdered, 10 grams were taken and separately treated: first by percolation with petroleum benzin; this removed most of the green coloring matter and none of the tannin, as the percolate upon evaporation and treatment with water failed to give to the proper reagents any indication of the presence of tannic acid. The maté was removed from the percolator, and, after drying, repacked and treated with alcohol of seventy-five per cent. until the percolate passed free of color; then the residue was removed to a flask and boiled with several successive portions of alcohol of the same strength, the several tinctures mixed, when cold filtered and the filter washed with alcohol. The alcohol was then driven off on a water-bath, and the solution made up to the previous measure with distilled water, and a slight excess of basic acetate of lead added, which threw down an abundant bright yellow precipitate. This was well washed with distilled water, decomposed by sulphuretted hydrogen, and after heating on a water-bath to remove excess of the sulphuretted hydrogen, the sulphide of lead was removed by filtration and the filter well washed with distilled water. The filtrate was a clear solution of an intense yellow color, and upon being evaporated on a water-bath to dryness yielded a light-brown amorphous mass, fusible by heat, and which, when powdered, was of a buff color; its solution strongly reddens litmus paper. The quantity obtained from each sample is shown in table No. I. It will also be observed that those samples containing the most tannin contained the least caffeine. The following is a description of the behavior of this peculiar tannic acid with different reagents:

With ferric salt it gives a bright green at first, turning to brown on standing and a brown precipitate; with ferrous salts no change at first, becomes green on standing and deposits very dark olive precipitate; with fixed alkalis transparent dark yellow color, unchanged by heat, no precipitate; lime water gives a transparent pure yellow, and on standing a grayish brown precipitate; aqua ammoniæ gives a transparent intense yellow, almost brown, no precipitate; acetate of copper gives a light-green precipitate, not soluble in excess of precipitant; sulphate of copper gives no precipitate in the cold, but when heated a brown precipitate is given; ammonio-sulphate of copper slowly precipitates in the cold, and at once if heated; nitrate of silver is reduced by the

aid of heat to the specular form ; auric chloride is decomposed in the cold ; barium nitrate gives a faint but immediate yellowish-white precipitate ; stannous chloride gives a white precipitate ; tartrate of antimony and potassium produces no precipitate ; sulphate of quinia and sulphate of cinchonia both produce white precipitates ; gelatin gives no precipitate ; acetate of lead gives a yellowish-white precipitate ; permanganate of potassium in solution is immediately decolorized ; molybdate of ammonium produces a brownish-red, which is changed to yellow by oxalic acid ; morphia gives a slight precipitate on standing ; strychnia gives a white precipitate ; aconitia gives no precipitate ; veratria with hydrochloric acid gives a white precipitate ; salicin and santonin give no precipitate ; piperina with hydrochloric acid, color lightened but no precipitate ; sulphuric acid, aided by heat, changes a concentrated solution to a deep red.

Caffeina.—The following process was employed for the determination of the quantity of *caffeina*: 10 grams of powdered maté and 4 grams calcined magnesia were boiled for half an hour with 500 cc. distilled water, and filtered while hot, the residue and the filter returned to the flask, 500 cc. water added, and again boiled for twenty minutes ; then filtered and boiling water poured on the filter until the filtrate passed colorless and tasteless. The filtrate was then evaporated at a moderate heat over a naked fire until reduced to 200 cc., and then 10 grams of powdered glass and 1 gram calcined magnesia were added, and the evaporation continued on a water-bath to dryness. The dry residue was then finely powdered and placed in a small flask with 30 grams chloroform, and boiled for a few minutes, and then filtered through a funnel, the neck of which was closed with cotton, and over this was placed a layer of powdered glass. The residue in the flask was treated with fresh portions of chloroform until the *caffeina* was all dissolved out. The chloroform was then allowed to evaporate spontaneously in a weighed capsule, yielding the *caffeina* in fine silky form on the bottom and sides of the capsule—perfectly white if the chloroform solution had been allowed to cool before filtration, but if filtered hot the *caffeina* was very slightly tinted of a greenish color. The amount of *caffeina* obtained from each sample will be found in table No. I.

The Ash.—The determination of the total, the soluble and the

insoluble ash was made as follows: 10 grams of maté was burned and the resulting ash weighed, then boiled in a little distilled water, and filtered while hot through a weighed filter, and the filter washed with boiling distilled water. The filtrate, upon evaporation and ignition, gave the weight of the soluble ash, which was verified by drying the the filter and its contents, and subtracting the weight of the filter from the total weight. The insoluble ash was then treated with hydrochloric acid, and after washing by decantation, the insoluble portion was dried, ignited and then weighed, the loss in the weight being taken as the quantity soluble in the acid. The portion insoluble in the hydrochloric acid was principally sand.

Owing to the usual mode of preparing maté, it is rendered certain that the ash is not all from the constituents of the leaves themselves, but partly from earthy matter introduced during the process of preparation.

Pharmaceutical Preparations.—The following preparations of maté are suggested: The simple infusion which is the form in which it is always used in South America; a solid extract prepared with alcohol of sp. grav. .822, and a fluid extract prepared with alcohol of sp. grav. .941, in such proportion that when finished its weight will be equal to the weight of maté used in its preparation. A considerable quantity of fluid extract prepared by this formula has been used in debility and in various derangements of the nervous system, generally with satisfactory results.

The reputed therapeutical properties of maté have been fully stated in a number of heretofore published papers, some attributing the most deleterious effects to its continued use, and others lauding it to the utmost limit of credibility, almost equaling the marvelous statements made of the action of the somewhat similar substance, Coca. In regard to maté, however, the writer is fully convinced that it does really possess properties which render it worthy of careful therapeutical investigation.

The thorough desiccation it undergoes in its preparation, and the compact and hermetical character of the packages in which it is contained, tend greatly to the preservation of whatever virtues it may have originally possessed.

NOTE ON THE ALKALOID SOPHORIA.

BY H. C. WOOD, M.D.

Some months since I gave notice¹ of the finding of an alkaloid having toxic properties in the bean of *Sophora speciosa* of Texas. During the past winter I have made some further study of the bean, which, although it does not exhaust the subject, has led to results worthy of publication. Other pressing engagements will prevent my giving more time to the matter, and it affords me pleasure to turn it over to the far abler hands of Professor Wormley, who hopes to make a thorough investigation. This much of apology. In the present state in which it was obtained sophoria is a transparent liquid, having a highly alkaline reaction, freely soluble in water, somewhat so in ether and very freely so in chloroform. When quite pure it is probably colorless, but, like other liquid alkaloids, it is very prone to undergo change, and I have never seen it free from a brownish tint. Its chloride crystallizes very readily, and appears to be a stable salt. With chloride of platinum it gives beautiful and peculiar crystals. When an acid is added to its watery solution drop by drop, very marked turbidity is produced, clearing up as more of the acid is put in. Crystallization is favored by not allowing the reaction of the solution to become distinctly acid; and there is reason for believing that the crystalline salt is basic, although I cannot speak positively upon this point. The most characteristic test is that, with the tincture of the chloride of iron, a deep blood-red color being produced.

I have tried various processes for preparing this alkaloid, but the only one which has yielded me any results is as follows: The powdered beans are first well moistened with strong alcohol and allowed to stand for two hours, the object being to coagulate the albuminous and gummy principles of the bean as much as possible. In order to avoid the extraction of the very abundant coloring matter of the shell, water not too strongly acidulated with muriatic acid is added in considerable quantity after the second hour, and maceration allowed to continue for a week. The expressed liquid is concentrated on a water-bath, and when cold rendered decidedly alkaline with carbonate of sodium, and agitated with an equal bulk of chloroform. On standing, the mixture separates into two layers, the lower being an emulsion of chloroform.

¹ See "Amer. Jour. Phar.," Jan., p. 33.

This, after twenty-four hours, is removed by decantation, or with a pipette, and the supernatant liquid treated with chloroform, as before.

The two emulsions of chloroform having been mixed, are thoroughly agitated with a half bulk of water acidulated with muriatic acid. By this procedure the alkaloid is more or less perfectly reconverted into the stable chloride. The chloroform is then by distillation recovered, and the mixture evaporated at a low temperature to the consistency of a thick syrup, care being exercised that the reaction be at all times decidedly acid. To the syrupy liquid strong alcohol is added, and the precipitated gum separated by filtration. The clear liquid is then evaporated upon a water-bath until all the alcohol is driven off and an impure solution of the chloride obtained. This is rendered strongly alkaline with carbonate of sodium, and extracted twice with an equal bulk of chloroform. The chloroform now separates readily, or by means of some of the manœuvres known to every worker in alkaloids, can readily be coaxed into doing so. It is then allowed to evaporate spontaneously. The impure alkaloid left behind is to be purified by solution in a small quantity of water acidulated with muriatic acid, filtering, rendering strongly alkaline with carbonate of sodium and extracting with chloroform. It is probable that this process would be not only simplified, but also improved by extracting the first concentrated infusion with strong alcohol, and thereby avoiding the first use of chloroform. The process is, however, here given as it was practised.

When given to frogs this alkaloid produced the symptoms which I detailed in my previous note. I found it to act much less powerfully upon mammals than I expected. Three grains of it hypodermically failed to very seriously affect a dog, but killed a cat in a short time.

EMULSIONES OLEOSÆ.

BY LOUIS VON COTZHAUSEN, PH.G.

(Read at the Pharmaceutical Meeting, April 16, 1878.)

In oil emulsions oil and water are mixed uniformly by means of gum, a mixture of gum and sugar, the yolk of eggs or alkalies. If properly made, there is neither any uncombined oil nor a separation into layers perceptible. They are universally considered more palatable, more acceptable to the stomach and of a nicer appearance than shake-mixtures, and thus combine the virtues of efficacy and elegance. There

are few preparations to which as little attention is devoted by the average druggist, in which he is less particular and skilled, and which he considers of minor importance, not considering that a poorly-made emulsion will certainly injure his reputation considerably, showing either his incompetency or his carelessness, or a little of both; while, on the other hand, if properly made, an oil emulsion will prove a splendid card for the pharmacist who dispenses it. We should always endeavor to give our preparations an elegant appearance, as long as it will not interfere with their therapeutical effects, but never follow the example of those who (*f. i.*, by filtering cloudy solutions containing insoluble ingredients) sacrifice the medicinal virtues rather than dispense an unsightly preparation. Physicians quite frequently, objecting to the presence of acids in solutions, or of gum or any other emulsionizer in mixtures containing oil and water, prescribe shake mixtures. In such cases, of course, we are not authorized under any consideration to endeavor to improve upon their recipe by additions of our own; while, on the other hand, when the practitioner desires an elegant and effective medicine it is our duty to try our best to furnish a perfect preparation. Looking over a prescription file we often notice that the doctor leaves it for us to decide how much of some ingredients is necessary to obtain a certain result, and particularly how much gum or other emulsionizer is required to prevent a separation of oil in a mixture. I happened to be present during a discussion between two druggists, one of whom claimed that an emulsion could be made by triturating the whole amount of oil prescribed, gum arabic and a certain portion of water, thrown together into a mortar at once, while the other considered this ridiculous, stating that every apprentice knew that it was necessary to form a mucilage first with gum arabic, sugar and some water, and then add the oil and balance of the water gradually. The particular oil they had reference to was *Oleum Morrhuæ*. This induced me to make the following experiments, emulsionizing codliver oil, copaiva, castor oil and oil of turpentine, respectively.

1. In making 5 ozs. of emulsion of codliver oil, let us follow the directions of the "Pharmacopœa Germanica," which orders *emulsiones oleosæ* to be made with 2 parts of oil, 1 of pulverized gum arabic and 17 (seventeen) parts of water, unless otherwise directed by the physician. I took *ol. morrhuæ*, fssiv ; *pulv. gum acaciæ*, ssii ; *aqu. dest.*, fssiv , poured the oil and water on the gum in a mortar, triturated them

well for a few minutes, when a good emulsion was formed, and then added sufficient water to make f̄v. This emulsion remains unchanged after keeping it six weeks at a constant temperature of 70°F.

2. I then reduced the quantity of water one-fourth, mixing at once ol. morrhuæ, f̄iv; powd. gum arabic, ʒii; aqu. dest., f̄iii, and then diluted with the balance of water; the result was the same. This is the favorite method of most German apothecaries, and is considered by them better and surer to bring success than the first. I have made very many emulsions by it with various oils during a number of years, and never failed. There are now on hand four emulsions containing 50 per cent. of codliver oil, castor oil, turpentine and copaiva, respectively, made by the second method about four weeks ago. So far they are still, as in the beginning, elegant in appearance, and show no inclination of spoiling or separating, although kept at a constant temperature of 70°F. Emulsions containing 50 per cent. of oil, made by the first method about two weeks ago, likewise appear unchanged so far.

3. A large proportion of gum is not objectionable in most emulsions, as *f. i.* copaiva emulsions, preventing the latter from having a too strong purgative effect; in others, however (*f. i.* castor oil emulsion), care must be taken, as a large proportion of gum would counteract the effect of the oil to a certain extent. I therefore reduced the quantity of gum arabic to one-half of its former quantity, thus making the proportions oil 4 parts, gum arabic 1 part, water 3 parts. Emulsions of codliver oil, castor oil, copaiva and oil of turpentine, made in this proportion, at first presented as elegant an appearance as those containing double the quantity of gum, and remained unchanged for three days, then the emulsion of copaiva began to separate into two layers, the lower one being only about one-fifth of the whole mixture; on being shaken they readily reunited, again forming, apparently, a perfect emulsion, which, however, began to separate again in the course of 24 hours. The emulsion of codliver oil began to separate a little at the end of four days, that of castor oil after six weeks, while the turpentine emulsion is still unchanged.

4. An attempt to reduce the amount of gum to one-fourth the original quantity, so as to bring the proportions—oil 8 parts, water 6 parts and powd. gum arabic 1 part, proved successful with codliver oil, turpentine and castor oil, but gave an unsatisfactory result with copaiva, even after considerable constant trituration. The emulsions of cod-

liver oil, turpentine and castor oil separated on standing for twelve hours, not showing any separated oil globules floating on top, but two distinct layers, the upper one of which still retained the appearance of a perfect emulsion, while the lower one was thinner and lighter in color; shaking slightly again mixed them perfectly. This proves that $\frac{3}{4}$ of gum arabic to the ounce of oil will only answer satisfactorily when the emulsion is to be used in a short space of time.

5. An emulsion made by shaking together in a bottle equal parts of codliver oil and of the officinal mucilage of gum arabic was a perfect success, not separating in the least. After standing for three weeks and two days, a separation into layers slowly commenced.

6. Cod-liver oil, $\text{f}\overline{\text{ss}}$ i, the yolk of one egg and $\text{f}\overline{\text{ss}}$ vi of aq. dest., mixed intimately by trituration, yielded a yellowish-white perfect emulsion, which could be diluted without separation, and remained unchanged for seven hours. It then separated into two layers, which reunited on shaking. Oil emulsions made by any of the mentioned processes will bear dilution with water, and the addition of syrups or tinctures after being perfectly combined.

7. Parrish's formula for codliver oil mixture reads as follows: Take of codliver oil $\text{f}\overline{\text{ss}}$ vi, lime-water $\overline{\text{ss}}$ ix. To the lime-water in a pint bottle add the oil, and shake, etc. I mixed $\text{f}\overline{\text{ss}}$ vi. of cod-liver oil and $\text{f}\overline{\text{ss}}$ ix of lime-water, and, after considerable incessant shaking, obtained a very satisfactory emulsion, containing 40 per cent. of codliver oil, which remained unaltered for five days. It then commenced to separate into two layers, the upper one in this case consisting of a small amount of oil, while the lower one, which was at least $\frac{1}{2}$ of the whole mixture, still appeared to be a perfect emulsion. But very little shaking was required to reunite them.

8. Experiments made with different formulas for "Emulsion of codliver oil and lacto-phosphate of lime," gave me the following results: By following the directions of the formula published by Mr. Shinn ("Amer. Jour. of Pharm.," March, 1873, p. 135) I obtained a nicely flavored emulsion. An attempt to mix the oil, water and gum in his proportions by throwing them together into a mortar and triturating them well, proved equally successful; the emulsion in this case, however, separated after standing for 24 hours, there being a narrow layer of oil visible floating on top of the emulsion. Shaking in this case also reunited them.

Mr. Chiles' formula ("Amer. Jour. of Pharm.," March, 1873, p. 104) also deserves mention, furnishing, if properly adhered to, a very satisfactory result. There is another formula for this preparation, usually used by me, which seems to be preferred by many physicians. It is pleasant, acceptable to the most delicate stomach, and will not separate, if properly made.

The recipe is as follows :

R Ol. Morrhue,	.	.	.	.	f̄iv.
Pulv. Sacchari albi,	.	.	.	.
" Gum. Acaciæ,	.	.	.	.	āā 5ss.
Ol. Gaultheriæ,	.	.	.	.	gttxxvi.
" Menth. Pip.,	.	.	.	.	gttvi.
Aqu. dest.,	.	.	.	.	f̄iv.
Misce, fiat emulsio, cui adde.					
Syr. Lactophosphatis Calcii,	.	.	.	.	f̄ii.

Mix the ethereal oils with the codliver oil ; make a thick mucilage with the gum, sugar and a small quantity of distilled water ; gradually and carefully, with constant trituration, add the oil and the balance of the water alternately.

The syrup of lacto-phosphate of lime is kept by me in a separate bottle, and added in the proper proportion before dispensing. I have never found any trouble in keeping it on hand during the warm season, except in one case, when the emulsion separated, which was, however, due to imperfect manipulation and too great haste when preparing it, as was proved by later experiments. This emulsion can be flavored differently, of course, by substituting oil of bitter almonds or any other desirable flavor for the oils of wintergreen and peppermint. The syrup of lacto-phosphate of lime used by me was made according to the formula published by Mr. Chiles ("Amer Jour. of Pharm.," 1873, p. 105), and seems very satisfactory.

9. A preparation prescribed much lately is "Emulsion of codliver oil with hypophosphites." It can be easily made by substituting the proper syrup in the formula given above.

QUINIA PILLS.

Editor American Journal of Pharmacy:—As an addition to the note of Mr. Brett, in the April number of the “*Amer. Jour. of Pharmacy*,” I send you a precise formula, which has been well known in our country for several years :

R Chinini sulfurici,	. . . . .	30 00 grams.
Gum. arab. pulv.,	. . . . .	5 00
Glycerin,	. . . . .	10 00

To the gum and glycerin, well triturated in a mortar, add gradually the quinia salt. The result is an excellent and unalterable mass.

ADR. NICKLÉS.

Benfeld (*Alsace*), April 17, 1878.

Editor of American Journal of Pharmacy:—In the April number of your valuable journal I have read with pleasure a communication from Mr. James E. Brett, regarding the make-up of quinia pills. And while I think the substances he proposed (powdered acacia and glycerin) will accomplish satisfactory results, still I think if powdered tragacanth be substituted for the acacia, with the use of glycerin, less difficulty will be experienced in making up the pills ; they will be of whiter appearance, and retain their properties unaltered for almost an indefinite period of time. In fact, I have found an excipient of this kind :

Powdered tragacanth,	. . . . .	3ii
“Glycerin,	. . . . .	q. s. to make a thick paste,”

to answer for making up a larger number of substances, in pill form, better than any other I have ever known. Any of the dry iron salts, such as phosphate, ferrocyanide, sulphate and citrate, can, with ease, be made into pills by using this excipient and a little “elbow grease.”

T. A. CHEATHAM, Ph.G.

Macon, Ga., April 12th, 1878.

ANOTHER PILL EXCIPIENT.

By J. J. BROWN, Ph.G.

(Read at the Pharmaceutical Meeting, May 21, 1878.)

What is the best pill excipient for general purposes? seems to be almost an unanswerable question. We have found that glycerin lacks sufficient adhesiveness ; vegetable extracts are inadmissible on account of their individual medicinal properties ; syrups and solutions of acacia

or tragacanth render a pill in time hard and insoluble; honey or molasses are inconvenient, besides attracting swarms of flies to the prescription counter, and crumbs of bread and confections of rose are too bulky.

The Glyceritum amyli of the B. P. is a step nearer perfection, but is wanting in adhesiveness, and decidedly hygroscopic. As the result of quite a number of experiments on this subject, the writer has found the following modified formula of the latter to serve a most excellent purpose :

R Powdered Starch,	℥ss.
“ Sugar,	℥i.
“ Tragacanth,	℥ii.
Water,	℥ii.
Glycerin,	℥iv.

Triturate the powders with the water and glycerin until a homogenous mixture is obtained; transfer to a porcelain capsule and apply heat until all the starch granules are ruptured, stirring constantly of course, to prevent burning.

This forms a jelly-like substance of such consistence as to be readily taken up on the point of a spatula. It undergoes no change on exposure (at least not in our equitable California climate) is possessed of enough *stickiness* to subjugate the most refractory pill mass, and contains sufficient glycerin to prevent the pill from ever becoming hard or insoluble.

Oakland Cal., May, 1878.

ON ASPIDIUM MARGINALE, Swartz.

BY CHAS. H. CRESSLER, PH.G.

(Read at the Pharmaceutical Meeting, May 21, 1878.)

In September, 1874, Dr. J. L. Suesserott, of Chambersburg, requested me to prepare for him an emulsion of oleoresin of male fern, which he administered with the result of the expulsion of but a small portion of tænia. The oleoresin furnished the doctor was bought from a wholesale druggist of good repute, and had the appearance of a pure article, but his failing to get a satisfactory result caused me to think that, if our indigenous fern had any comparative virtues, we could furnish a reliable preparation which would be one advantage; and even if it were not so active as the European plant, that this might be more than

counterbalanced by having the control of its preparation. I at once collected what I had thought to be *Filix mas*, selected the greenish colored remains of the leaf stalks, with an adhering portion of the rhizome, dried them by means of a gentle, artificial heat, and made an oleoresin according to the British formula. Dr. Suesserott administered the same quantity of this oleoresin that he had of the other to the same patient, the result of which was the expulsion of nine feet of *tænia*, including the head. For an expression of the doctor's satisfaction with the result see "Report of Franklin County Society," in the published "Transactions of Pennsylvania State Medical Society," 1875, page 637.¹

Believing this result sufficient for further trial, I gathered in October of the same year, 1874, more of the fern and made four ounces of oleoresin. I did not dispense this on prescriptions, however, but in August, 1876, a friend of mine stated to me that he was passing sections of tape worm. My anxiety to test still further the virtues of our indigenous fern led me to violate my usual custom of not prescribing. Two drachms of the oleoresin were put into nine gelatin capsules, of which three were taken at 10 P. M., and two at 12 P. M. Unpleasant eructations followed, so that no more of the preparation could be taken. A bottle of citrate of magnesium was taken at 6 A. M. next morning, and after an hour and a half, the subject passed over 24 feet of *tænia*, tapering down apparently close to the head, which, however, was not found. In the latter part of October, about two months after the expulsion of the 24 feet, the same person began to void fully developed sections of *tænia*. Two drachms more of the oleoresin were put into nine gelatin capsules. The subject, after fasting from 12 M., took three of these at 10 P. M., and one more at 12 P. M., and followed them in six hours with emulsion of castor oil, and in two-and-a-half hours he discharged 8 feet of the worm, tapering down apparently to the head, which, however, was not found in this instance either. To this date careful observation has failed to discover any further evidence of the presence of the parasite.

The fern used is an evergreen, and, according to Wood's Botany, seems to be the *Aspidium marginale* described by James Lemon Pat-

¹In reading the paragraph referred to, in first line read alcohol instead of tinct. phytolacæe.

terson in vol. 47, page 292, "Amer. Jour. of Pharm.," 1875. It grows along the banks of the Conococheague creek and other streams that wind through the fertile region of the Cumberland valley, but only on the rocky ledges that face northward. I never found it on those facing directly southward, and never on the mountain ranges that border our valley except a few stocks at springs along the foot of the mountain.

An interesting fact in support of this statement was noticed this morning on a visit to the yard of Dr. Suesserott. In a shaded portion of the ground on an elevated bed, having an evergreen honeysuckle as its principal occupant, a circular and marginal belt of these ferns had been planted in October, 1874. At this date they are still flourishing luxuriantly on only about two-fifths of the circle facing northward, while none whatever remain on the three-fifths of the circle facing southward, notwithstanding the fact that the north, east and south sides of this mound are surrounded at about equal distances with buildings of similar height.

Chambersburg, Pa., May 4, 1878.

NOTE ON ASPIDIUM MARGINALE.

By J. M. MAISCH.

Mr. Cressler has very kindly accompanied the preceding communication with various specimens comprising the tape worm expelled in August and October, 1876; specimens of the rhizome and stipes as used by him in preparing the oleoresin, and living plants and herbarium specimens of the same. As indicated by Mr. Cressler, the plant is *Aspidium marginale*, Sw., which, according to Gray, is very common on the northern section of this continent is of frequent occurrence in the rocky woodlands of Pennsylvania, and is met with farther south to the mountains of North Carolina (Chapman's Flora of the Southern United States). Our native species of *Aspidium*, as arranged in Gray's Manual, belong to two subgenera, viz.: *Polystichum*, which has the indusium or shield-like covering of the sori (fruit patches) orbicular, entire and attached by the depressed centre, while in the subgenus *Dryopteris*, the indusium is more or less kidney-shaped and notched at one side. The latter comprises the larger number (8) of species, which include both *Aspid. marginale* and *Asp. Filix-mas*. The true male fern occurs in rocky woods of the Keweenaw peninsula of Lake Superior and westward, and according to Porter and Coulter's Flora of Colorado,

also in the Grand Canon of the Arkansas, and along the foot-hills west of Denver. It agrees with *Asp. marginale* in having the stipes or leaf stalks covered at the base with a copious chaff of brown glossy scales, the fronds or leaves twice pinnate with the upper pinnules confluent, and the lower ones more or less pinnatifid-toothed and with some of the veins repeatedly forked. But the two species differ in the frond of *Asp. marginale* being evergreen and having the fruit dots close to the margin, while in *Asp. Filix-mas* the fruit dots are near the mid-vein, and the fronds do not survive the winter. The rhizome of the latter attains a thickness of one inch, and shows upon the cross section, about 10 larger, besides several smaller, and in the stipes about 8 irregular wood bundles, the former being arranged in a loose circle. The rhizome of *Asp. marginale* is thinner, about $\frac{3}{8}$ inch in diameter, and contains a loose circle of about six larger and smaller, and the stipes six very small wood bundles; otherwise in appearance and sensible properties the subterraneous portions of the two plants resemble each other very closely.

Since the constituents of the latter species have been proved by Mr. Patterson to be identical with those of the male fern, and since the efficiency of the American species has been shown through Mr. Cressler to be equal to that of *Asp. Filix-mas*, it is to be hoped that the next Pharmacopœia will place the two species on an equality, and authorize the indiscriminate use of the one which may be most convenient to collect. In the meantime, it is suggested that, if occasion offers, pharmacists will submit preparations of *Asp. marginale* for the use of physicians, and that the results obtained be duly recorded. In preparing the oleoresin, it must not be overlooked that only the *green* portion of the subterraneous parts be used, and that all the brown and decayed portions be rigidly excluded.

ACETIC ACID, PURE.

BY EDWARD GAILLARD, PH.G.

(Read at the Pharmaceutical Meeting, May 21, 1878.)

This acid, which, owing to alphabetical precedence, stands first on the many chemical lists of the day, also heads the list in point of antiquity, of the hundreds of manufactured acids now known. Under the name of vinegar, dilute acetic acid was known ages before

the discovery of any acid except those which exist ready formed in the vegetable kingdom. Having an organic origin, that is, being a resultant from changes produced in organic substances, by heat or otherwise, it is naturally rather troublesome to deprive it of some of the other simultaneously-produced compounds, such as empyreumatic oils, etc., without effecting a partial decomposition of the acid itself.

One method is to combine it with a base, such as soda or lime, and to maintain the resulting salt at a temperature sufficiently elevated partially to carbonize the empyreumatic substance. Even by this method, however, the desired result is not realized with economy, for if heated until complete carbonization of foreign matter is effected, the acetate also is partially sacrificed, and proves a loss.

In some parts of France and Germany the carbonate of baryta is used, instead of the corresponding soda salt, to produce the acetate, as acetate of baryta is more stable under the influence of high temperatures than acetate of soda.

Some of the acetic acid manufactured in this country is derived from the distillation of acetate of lime with a stronger acid, or is produced from pyroligneous acid of home manufacture. The former is generally of a better quality, and has a more acceptable odor.

As a perfect carbonization of empyreumatic oils cannot be effected without endangering, to some extent, the acetate, an acid perfectly free from them is rarely met with.

I have examined various samples of this acid and have found that all of them, after being neutralized and then mixed with a dilute solution of permanganate of potassa, would discolor this reagent from the presence of these oils. A very delicate test is the odor of the acid, which, if fragrant and pungent, without a smoky or empyreumatic smell, generally indicates that the acid is free from any large quantity of these substances.

However, when used in delicate operations, as in photography, it should be tested by adding to it an equal bulk of pure sulphuric acid, and if this does not color within a few hours the acetic acid may be considered pure.

The Dispensatory and the U. S. Pharmacopœia give, as a test for the presence of nitric acid, to digest the acid with silver, and then add chloro-hydric acid, when, if any be present, a precipitate of chloride of silver will be formed. I have, on several occasions,

digested acetic acid, to which one or two per cent. of nitric acid had been added, for half an hour on a warm sand-bath, without allowing the acid to boil, and, after the addition of chloro-hydric acid, failed to perceive any precipitation of the silver salt. I generally test it by first neutralizing the acid with carbonate of soda, and, after the addition of an equal volume of sulphuric acid, pure, free from nitric acid or selenium, allow the mixture to cool, and add a concentrated aqueous solution of sulphate of the protoxide of iron, without allowing its admixture. If the least trace of nitric acid is present a dark ring will be formed where the fluids are in contact.

The remaining impurities most common in acetic acids, and the means of detecting them, are alluded to in the table following :

ADULTERATIONS.	TESTS.	PURE.	IMPURE.
1 Water.....	1 Hydrometer.....	1 Sp. gr. 1.047....	1 Lighter.
2 Empyreumatic oils.	2 Odor.....	2 Agreeable smell	2 Empyreumatic odor.
3 Nitric acid.....	2 Boiled with an equal volume of sulphuric acid.	2 The acid is not colored.	2 The acid is colored.
4 Muriatic acid.....	3 Neutralized with carb. of potassa, with the addition of pure sulph. acid, and then concentrated solution sulphate iron.	3 No dark ring at point of contact of the iron solution.	3 A dark ring.
5 Sulphuric acid.....	4 Addition of nitrate of silver..	4 No precipitate..	4 Precipitate.
6 Sulphurous.....	5 Chloride of barium.....	5 No precipitate..	5 Precipitate.
7 Lead.....	6 Sulphuretted hydrogen.....	6 No precipitate..	6 Milkiness.
8 Copper.....	7 Sulphide of ammonium.....	7 No precipitate..	7 Black precipitate.
9 Lime.....	8 Sulphide of ammonium.....	8 No precipitate..	8 Black precipitate.
10 Formic acid.....	9 Oxalate of ammonia.....	9 No precipitate..	9 White precipitate.
	10 Boiled with an equal volume of solution nitrate silver or proto-nitrate mercury.	10 No precipitate..	10 Separates the nitrates by reducing them to the metallic state.

GLEANINGS FROM THE GERMAN JOURNALS.

BY L. VON COTZHAUSEN, PH.G.

Elastic Gelatin Capsules.—Detenhoff recommended to prepare them from 1 part of gelatin, 2 of water and 2 of glycerin, which, however, does not give a satisfactory mass, the capsules becoming opaque as the water gradually evaporates. The following formula is preferable, capsules made by it remaining transparent and elastic for years. Take 1 part of gelatin, 2 parts of water and 4 parts of glycerin; soak the gelatin in the water, and dissolve with a gentle heat; add the glycerin, and evaporate on a water-bath until 5 parts remain, that is until all the water is evaporated; into this warm melted mass dip the moulds, and proceed as usual.—*Pharm. Ztg. f. Russl.*, March 15, p. 164.

Pyrogallic acid stains are removed from linen by a solution of oxalic acid in 50 or 60 per cent. alcohol, and then exposing to the direct sunlight.—*Pharm. Centralb.*, April 11, p. 135.

Presence of Large Amount of Lime in Magnesia Usta.—Calced magnesia nearly always contains a trace of lime, the subcarbonate of magnesia being rarely free from it. Marquardt states that a larger proportion of lime, when present, is easily recognized by its characteristic caustic taste.—*Pharm. Centralb.*, April 11, p. 137.

Condensed Milk.—A writer in a Cologne paper makes the following comparison:

Cond. milk of Cham	contains for	100	albuminates	63	fat and	375	sugar
"	"	Kempfen	"	100	"	66	" 221 "
Woman's milk	"	"	"	100	"	62	" 147 "

The amount of sugar in condensed milk is thus shown to be double and even nearly three times as large as in woman's milk. For this reason Prof. Kehler, Dr. Daly and other physicians consider the former as not only not beneficial, but even injurious to infants, the sugar being transformed into lactic acid in the intestines, causing summer-complaint and other diseases. In their experience, fat and apparently healthy children may be raised on condensed milk who, however, will never equal in strength and resistance to disease those who were raised on woman's- or fresh cow-milk.—*Pharm. Post*, Feb. 16, p. 60.

Ethylic Alcohol in Coal-Tar.—At the fiftieth meeting of German naturalists and physicians, held at Munich, O. Wütl stated that a series of experiments with 150,000 kilos of common benzol had convinced him of the uniform presence in it of ethylic alcohol, the average amount being .2 per cent.—*Ztschr. wst. Apoth. Ver.*, April 10, p. 166.

Determination of Santonin in Levant Wormseed.—Dragendorff recommends to digest for 2 hours 15 or 20 grms. of the wormseed with 15 or 20 cc. of a 10 per cent. soda-lye and 200 cc. of water. The liquid is filtered, the residue washed with distilled water, the filtrates united and concentrated in a water-bath to about 30 or 40 cc. After cooling, the liquid is neutralized with hydrochloric acid, immediately filtered and the filter washed with 15 or 20 cc. of water. The precipitate may be washed with an 8 per cent. soda solution. If santonin crystals are formed on the filter these are collected, and afterwards united with the remainder of the santonin. The filtrate, after the

addition of more hydrochloric acid, is shaken three times with 15 or 20 cc. of chloroform; the chloroform extractions are washed with water and distilled to dryness; the residue is dissolved in very little soda-lye, filtered if necessary, and the filter washed with a little water. The solution is then strongly acidulated with hydrochloric acid and set aside in a cool place. Two or three days later the santonin may be collected on a filter, washed with 10 or 15 cc. of 8 per cent. soda solution, and after drying at 110°C ., weighed. For every 10 cc. of aqueous liquid, from which the santonin was precipitated (not counting the wash water), there may be added to the weight of the santonin .002 grm., and for every 10 cc. of soda solution used for washing .003 grm. — *Archiv d. Pharm.*, April, p. 306.

Salicylate of Sodium.—A. Bernick prepares a solution containing one-third of its weight of this salt by mixing 84 parts of bicarbonate of sodium with 200 p. of distilled water, and neutralizing without heat by 138 p. of purified salicylic acid. The resulting solution is nearly colorless, and remains unchanged if kept in black bottles.—*Pharm. Ztg.*, April 10.

Antidote to Carbolic Acid.—On the recommendation by Prof. Baumann, Dr. Sanftleben used sulphuric acid in several cases of poisoning by carbolic acid with the best success, the phenol combining with the acid to phenyl-sulphuric acid, which is not poisonous. He administered it in a mixture composed of dilute sulphuric acid 10.0, mucilage of gum 200.0, and simple syrup 30.0 grams, in doses of a tablespoonful every hour.—*Pharm. Ztg. f. Russl.*, Feb. 15, p. 119, from *Milit. Ztschr.*

The Dose of Caffeina.—According to Nothnagel's "Arzneimittelehre," citrate and lactate of caffeina are usually given in Germany in doses of .05 to .1 gram, but French physicians commence with doses of .5 and increase the dose to 2.0 and even 4.0. Dr. Kelp repeatedly gave doses of .12 gram four times daily without apparent injurious effects, and Dr. Wolff states the dose in migrana to be .2 to .4 gram several times a day.—*Pharm. Ztg.*, April 6.

Test for Impurities in Tannate of Quinia.—After numerous experiments, Julius Jobst recommends to proceed as follows: 1 gram of quinia tannate is powdered, well mixed with freshly-slaked lime and the mixture dried in a water-bath. The resulting powder is

extracted with chloroform, and this solution evaporated in a tared beaker. The residue, dried at 120° , represents the total amount of alkaloids present in the tannate. The residue in the beaker is dissolved in a little water, acidulated with a few drops of diluted sulphuric acid, filtered if necessary, mixed with 3 or 4 cc. of ether and shaken with an excess of ammonia. If quinia alone is present the liquid will separate into two clear layers, while in the presence of other alkaloids a precipitate will appear, either at once or after a while; such a precipitate may then be further examined in the usual manner. An analysis of a so-called tasteless tannate of quinia gave 4.46 per cent. of quinia, 7.33 per cent. of cinchonidia and 11.97 per cent. of conchinin (quinidia).—*Archiv der Pharm.*, April, p. 331.

Test for Codëia.—Some years ago O. Hesse confirmed the observation of Riegel and others, that codëia dissolves colorless in concentrated sulphuric acid at 20° , and observed that in the presence of impurities colored solutions are obtained; if the impurity consists of oxide of iron the solution will be blue. This has led to the adoption for certain opium bases of a test liquid, consisting of pure sulphuric acid, to which a very small quantity of ferric chloride is added. To succeed with the test, Hesse states that the codëia should be finely powdered and well dried; 2 or 3 milligr. of this are mixed in a clean test-tube with 1 to 1.5 cc. of pure H_2SO_4 , when a colorless solution will be at once produced. The acid containing iron is used in a like manner.—*Arch. d. Phar.*, April, p. 330.

Glycerin in Contact with Bicarbonate of Sodium and Borax.—On adding water to a mixture of equal parts of bicarbonate of sodium and borax no reaction takes place; on the addition of glycerin carbonic acid is generated. After warming until the effervescence ceases, the solution contains borax and monocarbonate of sodium. Experiments have proven that exactly one-half of the carbonic acid existing in the bicarbonate is liberated.—*Pharm. Centralb.*, April 4.

Ferrum Albuminatum Siccum.—E. Merck states that dry albuminate of iron, which only requires solution in water to make Triese's (or, according to Merck, Friese's) solution (see "*Am. Jour. Phar.*," March, p. 126), has been manufactured at his laboratory for several years past, and consists of small brownish-red luminous crystals, is not hygroscopic, slowly dissolves in 50 parts of cold water, and more

readily in the same solvent at 30° to 35°C . Its solution is translucent and opalescent, neutral to test paper, but will precipitate oxide of iron in flakes after standing for some time. On gradually adding 10 to 12 drops of pure muriatic acid, spec. grav. 1.12, the solution becomes clear; in case a slight turbidness remains, it can be removed by filtration. After mentioning that Schlickum was unsuccessful in all his experiments with dry albuminate of iron, there being always an insoluble residue amounting to 20 per cent. on redissolving the coagulum of chloride of iron and albumen obtained by evaporating to dryness; Dr. Hoffmann suggests to mix the chloride of iron and albumen in a certain proportion, each previously reduced to a fine powder; thus the insoluble residue will be avoided. He operates as follows: 15 parts of crystallized chloride of iron ($\text{Fe}_2\text{Cl}_6 + 12\text{H}_2\text{O}$, containing 20 per cent. of metallic iron), or 20 parts of liquor ferri sesquichlorati are dried with 10 parts of dextrin at 40° to 50°C ., and pulverized; then 80 parts of pulverized albumen are mixed with it. The latter is obtained by mixing fresh albumen with half its weight of water, setting aside for several hours, then removing the membrane by straining, and finally evaporating on flat plates at a temperature of 30° to 40°C ., which is easily accomplished, albumen being not in the least hygroscopic; when dry it is easily removed from the plates. The author considers this dry albuminate of iron by far preferable for making Triese's solution, claiming that in this manner the solution will always have a uniform taste, composition and strength.—*Phar. Zeitung*, March 23 and 30.

THE CINCHONA ALKALOIDS.

By O. HESSE.

Translated and condensed from "Berichte der Deutschen Chemischen Gesellschaft," 1877, p. 2152—2162, by L. v. Cotzhausen, Ph.G.

Quinia, $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2$. Precipitated by ammonia or soda, it is amorphous and anhydrous, but soon combines with $3\text{H}_2\text{O}$, forming small crystals. Both the anhydrid and trihydrate are readily soluble in ether, which on slow evaporation yields some fine white needles; the balance, at first amorphous, becomes crystalline after some time. The ethereal solution sometimes gelatinizes suddenly from the separation of quinia, which is then less freely soluble in ether, requiring at 15°C . for 1 part of quinia (anhydrous) 16 to 25.5 parts of ether to effect solution. The anhydrid fuses at 177°C ., the trihydrate at 57°C .; the former dissolves

in hot water without fusing, and on cooling separates in needles; the latter fuses in boiling water, and on cooling does not crystallize. A solution of quinia in an excess of diluted H_2SO_4 has a blue fluorescence, while with a solution in diluted HCl this is not the case. The fluorescence disappears also upon the addition of other substances, notably of chlorides. Quinia solution turns polarized light to the left. Chlorine and ammonia in excess cause a green coloration (thalleiochin). The neutral sulphate $2\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2 \cdot \text{SO}_4\text{H}_2 + 8\text{H}_2\text{O}$ is very efflorescent; the medicinal salt should contain 15.3 per cent. water of crystallization $= 7\frac{1}{2} \text{H}_2\text{O}$.

Quinidia (conchinin), isomeric with quinia, but rotating to the right, was discovered by van Heijningen; it crystallizes from alcohol with $2\frac{1}{2} \text{H}_2\text{O}$ in efflorescing prisms; from ether in rhombohedrons with $2\text{H}_2\text{O}$; from boiling water in delicate plates with $1\frac{1}{2} \text{H}_2\text{O}$; in the two latter forms it does not effloresce at the ordinary temperature. The salt mostly met with in commerce has the formula $2\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2 \cdot \text{SO}_4\text{H}_2 + 2\text{H}_2\text{O}$.

Quinicia, $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2$. By heating the sulphate or other salt of quinia or conchinia until melted it is transformed into sulphate of quinicia without losing in weight. Quinicia is amorphous, rotates the plane of polarization to the right, and is never present in cinchona bark.

Diconchinia, $\text{C}_{40}\text{H}_{46}\text{N}_4\text{O}_3$, the principal constituent of chinoidin, is amorphous, fluoresces in a sulphuric acid solution, like quinia and quinidia; gives a green coloration with chlorine and ammonia in excess, and rotates the plane of polarization to the right. It does not yield quinicia, and has not yet been converted into quinidia.

Cinchonidia,¹ $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}$, first observed by Henry and Delondre (1833), again discovered by Winckler (1844) as quinidia, and subsequently called α quinidia by Kerner, crystallizes from alcohol in shining prisms, rarely in delicate white needles or plates, the crystals being anhydrous. Its solutions rotate the plane of polarization to the left, are not fluorescent and not colored green by chlorine and ammonia. The sulphate has the formula $2\text{C}_{20}\text{H}_{24}\text{N}_2\text{O} \cdot \text{SO}_4\text{H}_2 + 6\text{H}_2\text{O}$, and is nearly insoluble in chloroform, but swells with it to a jelly-like mass.

Cinchonia, $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}$ (isomeric with cinchonidia), crystallizes from hot stronger alcohol in shining anhydrous prisms. Its solutions are

¹ The author states that Pasteur's quinidia consisted of nearly 2 parts of Winckler's quinidia and 1 part of Koch's cinchonidia.

dextrogyre, and show no fluorescence. The sulphate $2C_{20}H_{24}N_2O \cdot SO_4H_2 + 2H_2O$ crystallizes from water in compact prisms.

Cinchonidia, $C_{20}H_{24}N_2O$, anhydrous monobasic sulphate of cinchonidia or cinchonidia, heated to $130^\circ C.$, or until they melt, are transformed into sulphate of cinchonidia. The alkaloid rotates the plane of polarized light to the right, is amorphous and never present in cinchona barks. Some salts are crystallizable.

Dicinchonia, $C_{40}H_{48}N_4O_2$, may be expected in the chinoidin of such barks which contain a large percentage of cinchonidia or cinchonidia. As yet it has not been obtained entirely free from diconchinia.

Homocinchonidia, $C_{19}H_{22}N_2O$ (Koch's cinchonidia, 1877), crystallizes from strong alcohol in large prisms and from diluted alcohol in scales, and deviates the plane of polarized light to the left. The sulphate, $= 2C_{19}H_{22}N_2O \cdot SO_4H_2 + 6H_2O$, crystallizes in very delicate needles, which have a gelatinous aspect, and while still moist melt at about $30^\circ C.$; when carefully dried it resembles magnesia in appearance, is usually anhydrous, and in this condition swells with chloroform to a jelly-like mass. The *cinchovatina* (*aricina*) of Winckler, from Cinch. ovata, is mainly this alkaloid.

Homocinchonia, $C_{19}H_{22}N_2O$, is probably identical with Skraup's (1877) *cinchonidia*, and appears to be present in the bark of Cinch. rosulenta.

Homocinchonidia, $C_{19}H_{22}N_2O$, an amorphous alkaloid, is formed when the anhydrous monobasic sulphate of homocinchonidia is melted. Its oxalate, $= 2C_{19}H_{22}N_2O \cdot C_2H_2O_4 + 4H_2O$, greatly resembles the corresponding salt of cinchonidia.

Dibomocinchonia, $C_{38}H_{44}N_4O_2$, is amorphous, rotates the plane of polarization strongly to the right, yields amorphous salts and is also present in the bark of Cinch. rosulenta.

Quinamina (*chinamin*), $C_{19}H_{24}N_2O_2$, discovered by the author (1872) in the bark of *C. succirubra* grown at Darjeeling, and subsequently in all barks of the same species from British India and Java, in Mutis' *Quinquina rouge*, and in the barks of *C. nitida*, *C. erythrantha*, *C. erythroderma*, *C. rosulenta*, *C. calisaya* var. *Schuhkrafft* and *C. calisaya*, known in English commerce as *Para-bark*. It is separated from the amorphous alkaloids by precipitating the dilute acetic acid solution with potassium sulphocyanide until the liquid is pale yellow; when clear it is supersaturated with ammonia, agitated with ether, the ethereal

solution evaporated and the residue crystallized from hot dilute alcohol; the mother-liquor retains the balance of the amorphous bases. The author now regards his first formula, $C_{20}H_{26}N_2O_2$, as incorrect.

Conquinamina, $C_{19}H_{24}N_2O_2$, is present with the preceding in *C. succubra* and *C. rosulenta*, and perhaps in all barks mentioned above. It crystallizes in long shining prisms, which melt at $123^\circ C$, while quinamina melts at $172^\circ C$. It is more powerfully dextrogyre than quinamina, and, like it, is precipitated by chloride of platinum only from concentrated solutions, and yields with chloride of gold a yellow precipitate, changing to purple, and with hydriodic acid a salt crystallizing in handsome prisms.

Quinamidia, $C_{19}H_{24}N_2O_2$, an amorphous alkaloid, is formed when quinamina is boiled for some time with diluted H_2SO_4 ; it is precipitated from an acid solution with difficulty by ammonia, more easily by soda, and is easily soluble in ether. With HCl it forms prismatic crystals, sparingly soluble in water, and with chloride of gold a yellow amorphous precipitate, soon turning purple.

Apoquinamina, $C_{19}H_{22}N_2O$, is isomeric with homocinchonidia, and is formed by the action of concentrated HCl on quinamina and conquinamina $C_{19}H_{24}N_2O_2 - H_2O = C_{19}H_{22}N_2O$. It is a white amorphous powder, very soluble in ether, alcohol and in diluted HCl . The chloride is amorphous; chloride of platinum causes a yellow amorphous precipitate $(C_{19}H_{22}N_2OHCl)_2 + PtCl_4$; chloride of gold gives a similar precipitate, which does not turn purple.

Quinamicina, $C_{19}H_{24}N_2O_2$, is formed when quinamina and probably also conquinamina, in the form of sulphate, is heated to $100^\circ C$. The residue is dissolved in cold water, precipitated by sodium bicarbonate, and the alkaloid freed from quinamidina by repeated solution in acetic acid and precipitation with bicarbonate. Quinamicina is a white amorphous powder, which fuses between 95 and $102^\circ C$, is slightly dextrogyre and freely soluble in ether and in diluted H^2SO^4 ; the latter solution yields yellow precipitates with the chlorides of platinum and of gold.

Protoquinamicina, $C_{17}H_{20}N_2O$, is formed, like the preceding, by raising the temperature to above $100^\circ C$, preferably to between 120 and $130^\circ C$. The sulphate is nearly insoluble in cold water. The alkaloid is insoluble in ether, but dissolves readily in acetic acid, forming a brown solution, from which it is precipitated by ammonia or

sodium bicarbonate, in light brown amorphous flakes, becoming black-brown on drying.

Paricina, $C_{16}H_{18}N_2O$, found with quinamina in red bark from Darjeeling; it is at once precipitated by bicarbonate of sodium from dilute solutions, and forms a pale yellow amorphous powder, soluble, with a yellow color, in ether, when fresh, and yielding amorphous salts; chloride of gold causes a muddy yellow coloration, which will not turn purple.

Paytina,¹ $C_{21}H_{24}N_2O + H_2O$, contained in the white cinchona bark of Payta; it crystallizes in beautiful prisms, and has the same reaction with chloride of gold as quinamina, conquinamina and quinamidina; it differs from them, however, in being easily precipitated by chloride of platinum. Paytina rotates the plane of polarized light to the left.

Paytamina is the amorphous alkaloid present with paytina in the above bark; it is easily soluble in ether, is colored purple by chloride of gold, and precipitated by chloride of platinum.

Cusconina, $C_{23}H_{26}N_2O_4 + 2H_2O$, crystallizes in small plates, was discovered by Leverkühn in Cusco cinchona, and differs from all other cinchona alkaloids by forming an amorphous, jelly like sulphate with H_2SO_4 , which is not dissolved by adding more acid. Its acetate and other salts are likewise gelatinous.

Aricina, $C_{23}H_{26}N_2O_4$, is found in the same bark as cusconina; it was discovered by Pelletier and Coriol, crystallizes in white, shining prisms, which melt at $188^\circ C.$, rotates the plane of polarization to the left, like cusconina, and forms salts, which are sometimes gelatinous, but are more characterized, particularly the binoxalate and acetate, by their sparing solubility.

Cusconidina, also a constituent of the Cusco-bark, is precipitated by ammonia from solutions in acids in pale yellow amorphous flakes, which after being washed form a loosely coherent mass, become denser on drying in the air, and ultimately melt together. Its composition has not yet been determined.

Javanina was separated by the author from the so called amorphous bases of Java calisaya bark. It separates from water slowly in rhombic scales, is very easily soluble in ether, without crystallizing on evapora-

¹ In the formula published in "Berichte," H_{20} was erroneously given; the alkaloid was discovered by Hesse in 1870.—EDITOR.

tion, dissolves in dilute sulphuric acid with an intense yellow color, and yields with oxalic acid a neutral salt crystallizing in scales.

Another alkaloid was observed in young calisaya bark from Bolivia; it is liquid, produces a greasy stain upon paper, and has a penetrating odor reminding of quinolina.

Other derivatives are the *hydrocinchonins* and the bases obtained by Zorn by acting with highly concentrated muriatic acid upon the four more common cinchona alkaloids.

SULPHATE OF QUINIDIA.

BY DR. J. E. DE VRIJ.

In reading the transactions of the Paris Société de Pharmacie (see "Amer. Jour. Phar.," April, p. 204,) in the meeting on the 9th of January, my attention was struck by the conclusion of M. Petit "that the neutral sulphate of quinidia does not contain water of crystallization." This conclusion, combined with the wish of a Dutch chemist, expressed in one of our journals, to become acquainted with a cheap reagent to test the purity of the commercial sulphate of quinidia, induces me to communicate some particulars about this compound.

Professor A. C. Oudemans determined the molecular rotation of this salt dissolved in absolute alcohol.

A salt prepared by himself, $2(C_{20}H_{21}N_2O_2)SO_4H_2 + 2H_2O$, in which he found experimentally 4.5 per cent. of water yielded a molecular rotation of $255^\circ 2' 3$.

A salt beautifully crystallized in very long needles, presented to me by Messrs. Howard & Sons, in which he found 4.5 per cent. of water, yielded a molecular rotation of $255^\circ 4' 3$.

A salt presented to me by M. Tallendier, of Argenteuil, in which he found 4.6 per cent. of water, yielded a molecular rotation of $254^\circ 9'$.

From these experiments it follows that the crystallized sulphate is scientifically not anhydrous, but contains two molecules of water of crystallization=4.603 per cent. From a commercial point of view, however, I found that M. Petit is right, for 7.003 grams of commercial sulphate of quinidia, presented to me a few years ago by Messrs. Howard & Sons, lost only 0.025 grams=0.35 per cent. by a long exposure to the heat of a water-bath. It seems, therefore, that the pure crystallized sulphate loses its water of crystallization very easily.

The test for the purity of this salt is based upon the fact, which I

found more than twenty years ago, that the hydriodate of quinidia requires more than twelve hundred parts of cold water to dissolve it.

One gram of sulphate of quinidia, prepared by myself, in 1856, chemically pure, from a specimen of quinidia kindly presented to me by Mr. J. Eliot Howard, was dissolved in 50 grams of hot water, and to this solution added 0.5 gram of potassium iodide. By this addition a heavy sandy crystalline powder of hydriodate of quinidia was precipitated, and on filtering off the liquid on the next day, the clear liquid was not altered by the addition of a few drops of liquor ammoniæ, but remained *perfectly clear*.

Having ascertained by this experiment the behavior of the chemically pure sulphate of quinidia under the circumstances mentioned, I applied this test to the good commercial sulphate, presented to me a few years ago by Messrs. Howard. I found that the liquor filtered from the precipitated hydriodate of quinidia became *slightly* turbid by the addition of liquor ammoniæ, but without separating an appreciable precipitate.

Therefore, the practical test for the purity of the commercial article is to dissolve one part of the salt in fifty parts of hot water, and to add to this solution a half part of iodide of potassium. If the precipitate is not sandy, but resinous, no further trouble need to be taken, for this resinous aspect proves that the salt contains either cinchonia or cinchonidia, or perhaps both of them. If, however, the precipitate constitutes a heavy sandy crystalline powder, the filtered liquid is, after some hours, tested by liquor ammoniæ. If this addition makes the liquor only slightly turbid *without formation of an appreciable precipitate*, the conclusion is that the salt is really good sulphate of quinidia, and contains only traces of other cinchona alkaloids, which generally is a slight trace of cinchonia.—*Phar. Jour. and Trans.*, March 23, 1878.

The Hague.

**NOTE on a CRYSTALLIZABLE INDIFFERENT RESIN
of GURJUN BALSAM, an ADDITION to the "PHAR-
MACOGRAPHIA."**¹

BY PROFESSOR FLÜCKIGER.

In the "Pharmacographia," p. 204, it is stated that copaivic acid is by no means an abundant and common constituent of copaiba. The only kind of that balsam I have ever met with, which readily yields

¹Translated from the *Archiv der Pharmacie*, February, 1878.

crystallized acid is that mentioned in the said book. The drug alluded to was contributed from Trinidad to the London Exhibition of 1851. The crystals before me are of decidedly acid reaction on litmus paper. I have recently again examined several varieties of copaiba, but have not been successful in obtaining copaivic acid from them. At the same time I prepared the essential oils from them and was astonished to find them all levogyre, although I had submitted to distillation not only levogyre varieties of the balsam, but also strongly dextrogyre ones. I must say in fact (see "*Pharmacographia*," p. 204), that I have as yet not met with an *oil* of copaiba deviating to the right.

Some time ago I noticed in the price list of Gehe's and Co, Dresden, "crystallized copaivic acid." On applying for it, and at the same time for the very balsam from which it had been extracted, I was at once informed that the material by which the acid had been afforded was "East Indian copaiba." The balsam sent, together with the crystals, proved indeed to be *Balsamum Dipterocarpi*, as described by Hanbury and myself in "*Pharmacographia*," p. 81. I therefore supposed the crystals sent by Gehe and Co. to agree with gurjunic acid, but found them to be devoid of acid character. They were slightly yellowish and undoubtedly crystalline, and soluble, although not precisely in abundance, in the usual solvents for resins. Among them I found petroleum spirit, boiling at about 80°C., the most suitable for purifying the crystals. If they are dissolved in about twelve parts of that liquid, tolerably well-formed crystals, thin prisms—sometimes as long as two-fifths of an inch—are obtained by exposing the solution to cold. I have not been able to get finer crystals, either by evaporation of the petroleum spirit solution or by using alcohol.

The purest, perfectly transparent and colorless crystals of the best crops begin to melt at 126°C. without diminishing their weight; they are in fact anhydrous; somewhat more considerable quantities cannot be perfectly liquefied before reaching 130°. Gurjunic acid,¹ according to Werner (*Zeitschrift für Chemie*, 1862, 588), melts at 220°. The resin under notice, as purified by me, after it has been melted, forms an amorphous mass, reassuming immediately the crystalline form as soon as it is slightly touched with alcohol. By heating the crystallized

¹It is called "gurgunic acid" in the German books, owing no doubt, to a misprint, for I am not aware that in India they ever write "gurgun balsam" but always "gurjun," although I am unable to say what this word signifies.

resin in a platinum capsule it is partly volatilized, and evolves the same odor as is given off by heated colophony—partly it is charred, the small amount of charcoal being easily burnt away.

The crystallized resin is not dissolved even by boiling caustic lye, nor does it possess an acid reaction on litmus paper; it is in no way capable of yielding any compound with basic substances. Its saturated solution in petroleum spirit displays no rotatory power on polarized light.

It forms an orange solution with concentrated sulphuric acid, becoming decolorized and turbid on addition of water. If submitted to destructive distillation an acid oily liquid of a rather agreeable odor is produced. By using potash the resin under notice is not much altered, nor by heating it with anhydride of acetic acid.

Submitted to ultimate analysis by Dr. Buri, in my laboratory, the resin in burning yielded

	I.	II.	III.
CO ₂	0'2476	0'2354	0'2492
OH ₂	0'7369	0'6996	0'7419
	0'2535	0'2410	0'2557

Answering in percentages—

C	81'16	81'05	81'16
H	11'38	11'37	11'40
O	7'46	7'58	7'40

The formula C₂₃H₄₆O₂ would require

28 C	336	81'16
46 H	46	11'11
2 O	32	7'73
		<hr/> 100'00

The crystallographic character of the resin has been examined and carefully described by Dr. Bücking, in Professor Groth's "Zeitschrift für Krystallographie," Leipzig, 1877, 389. The crystals belong to the asymmetric system and are long prisms.—*Phar. Jour. and Trans.*, March 16

HOSPITAL STEWARDS, U. S. A.

Editor American Journal of Pharmacy:—On behalf of the Hospital Stewards, U. S. A., allow me to tender our sincere acknowledgments for the service you have rendered in advocating our cause in your valuable journal. As the subject of our rank, duty and pay seems to be little understood outside of army circles, permit me to make a few remarks with the view of rendering it more intelligible.

First, our *rank*: This is but nominal; virtually speaking we hold no rank what-

ever, and outside of the hospital proper we are subject to the orders of the junior corporal of the regiment or post. It may be said that we certainly do hold a definite rank according to "regulations." This would be the natural inference to be drawn from the wording of the law creating our grade, but this law, or regulation, is ignored in every instance, as can be clearly shown.

Our warrants are issued and signed by the Secretary of War, and should, therefore, have precedence of those issued by company and regimental commanders to the various non-commissioned officers of their commands.

That such, however, is not the case, I will cite the law which fixes the rank :

"Rank of non-commissioned officers :

1st, Cadets,	4th, Ordnance Sergeants,
2d, Sergeants Major,	Commissary Sergeants and
3d, Quartermaster's Sergeants,	Hospital Stewards."

Now, although holding the same rank as Ordnance and Commissary Sergeants, we receive less pay than either.

Not only is our rank ignored in so far as relates to the source of our warrants and in the matter of pay, but also as regards the custom of the service, for example : if the troops of a post or camp are removed and a corporal, or for that matter a private, is left in charge of the government property, the said corporal or private, according to the custom, commands the Hospital Steward.

Now as to our *duties*: That they are multifarious, disagreeable and full of responsibility will be sufficiently clear to any one who will take the trouble to read our "Vade Mecum," the "Hospital Steward's Manual," which has been published and adopted by the War Department, as a guide for the Hospital Stewards of the army. At the same time, this manual is utterly silent on the subject of Stewards performing the responsible duties of the Post Surgeon, which we are called upon to do more or less every day.

For the last two weeks the writer has been attending to all the sick in garrison at this place, and performing all the duties of the Post Surgeon, on account of sickness of the Surgeon in charge. In my diary I find recorded six cases of midwifery attended to during my last four years of service, five of these were thrown on my hands by reason of sickness or absence of the Post Surgeon at the time of their occurrence, and the other because the woman had refused to do the Surgeon's washing and was afraid that he would, on that account, refuse to attend her.

Again, there are a large number of surgeons who, when called upon by the enlisted men and laundresses of the garrison, instead of attending in person, send their steward with instructions to do what he can for them, and if necessary take them into the hospital, where the surgeon will visit them next day.

In this and various other ways a great amount of the Post Surgeon's duty is thrown upon the shoulders of the steward, and for all which he receives the munificent salary of \$30 per month.

This brings me to the subject of our *pay*. When our grade was first established our sole duty consisted of drawing the rations for the sick in the hospital and superintending the cooking and distribution thereof. At that time the surgeon performed all clerical labor, prepared the medicines, compounded his own prescrip-

tions, in fact performed all those duties connected with the medical department which require intelligence and responsibility. At that time our pay may have been ample. But now all this has changed; gradually all these duties have been assigned to the steward, until at the present time nothing remains to be done by the Post Surgeon but visit the sick once daily, write the prescriptions and sign his name to the official papers and reports required of him.

This is all very well, the surgeon should not be hampered with all the minor details of his calling, he should have ample time for study and reflection, so that he may be able to keep abreast in the rapid advance which medical science is making in these days. At the same time it is no more than just that the pay of stewards should be increased in proportion to the increase of their duties and responsibilities, and their rank made commensurate with their calling and social condition. We do not want a liberal salary, nor a sinecure, if such a thing is possible for Hospital Stewards,—all we ask for is justice.

Apothecaries of the navy receive \$60 per month, yet their duties are not to be compared with those of the stewards, who, in addition to the great disadvantage in their pay as compared with the "apothecary," are changed from post to post more frequently than any other class of men in the army. As two-thirds of the stewards are men of family, their small savings, if they are able to make any, are absorbed during these frequent changes of station, and often their slender pay has to be mortgaged in order to obtain transportation for their families. To illustrate what straits they are often put to I will relate a case which came under my observation, and which would be amusing were it not a shame to the government which permits such a state of affairs to exist:

The wife of steward G — had been sick for two weeks; the soiled clothes of the family were laid aside the first week, as G. had no money to have the washing done. As his wife's health was no better the second week steward G. concluded to pitch in and do the washing himself; for this purpose he selected a day when he knew the Post Surgeon would be absent from the post, believing that then he would be more likely to finish his laundry duties without being discovered or interrupted. When his work was about half finished he was summoned in great haste to see one of the company laundresses. On visiting her he became convinced that in less than two hours there would be an addition to the family. Hastening back to the wash-tub he finished his work and returned to his post at the bedside of the woman and saw her safely delivered. (This same steward is now a prosperous druggist in Chicago, Ill.)

I could mention numerous instances of a similar nature if space permitted.

It is well known and conceded by all who are conversant with the facts that the Hospital Stewards, as a "class," are superior in knowledge and ability to any other class of enlisted men in the army. But at the same time we cannot close our eyes to the fact that worthless and incompetent men have, by favoritism and otherwise, obtained entrance to our corps.

The remedy for this lies in the hands of the government. No one should receive the appointment until a careful, systematic and impartial examination shall have determined his fitness for the position, and candidates should be limited to graduates of Pharmaceutical Colleges in good standing.

In order to bring about this desired reform it is absolutely necessary that our pay as well as our rank be increased; for it is absurd to suppose that good and capable men in civil life will come forward to compete for a position in the army, where, in nine cases out of ten, owing to the inferior rank, they will be compelled to surrender all manhood and self-respect and receive the pitiful sum of \$30 per month for a service for which, in civil life, they would receive double that amount, and at the same time be free and independent men, the value of which is not to be estimated in dollars and cents.

A HOSPITAL STEWARD.

April 4th, 1878.

VARIETIES.

Alkaloids of Opium, their Action.—The well-determined opium alkaloids now number sixteen. The effect of any one differs from the rest or from that of opium itself. Dr. Isaac Ott (*"Jour. Nervous and Mental Diseases,"* Jan., 1878), reports a large number of experiments which, added to our previous knowledge, enable him to draw the following conclusions:

1. Cryptopia is narcotic; excites and then depresses reflex action by an effect on the spinal cord, reduces power of motor nerves, abolishes sensation by an action on the spinal sensory ganglia and lowers the heart beat by an action on its muscular structure.
2. Thebaina is a spinal convulsant, has no action on motor or sensory nerves or striated muscle. It reduces the heart beat by an action on that organ, and increases blood pressure by stimulating the cerebral vaso-motor centers.
3. Codeia is a narcotic and spinal convulsant, produces a veratroid contraction of striated muscle and depresses the heart-beat by an action on the cardiac muscle.
4. Chloroodia is a tetanic agent.
5. Apocodeia produces vomiting, coma and death.
6. Narceina is soporific to cold blooded animals, but not to man, and is a spinal convulsant; it does not destroy the motor nerves, as they act on thrusting a probe down the spine; it produces veratroid contraction of the muscle, and reduces the heart beat by stimulation of the peripheral end of the pneumo-gastric.
7. Papaverina is narcotic and convulsant, the convulsions being partly spinal and partly peripheral, the latter, it is highly probable, from an action on the muscle; it diminishes the heart's contractions by peripheral action on the cardio-inhibitory apparatus; it also causes veratroid contraction of the muscle.
8. Narcotina is non-narcotic and a spinal convulsant, produces veratroid contraction of striated muscle and is a very active agent to decrease the beats of the heart by an action on cardiac muscle.
9. Cotarnina is soporific, and paralyzes, like curare, the motor nerves.
10. Hydrocotarnina is narcotic and convulsant.
11. Hydrochlorate of cotarnamic acid is a convulsant, and paralyzes the pneumo-gastric.
12. Laudanosina and laudanina are tetanic agents.
13. Morphia is a narcotic and spinal convulsant; it produces veratroid contraction of muscle and reduces the heart-beat.
14. Oxymorphia has an action like morphia, only weaker.
15. Apomorphia is an emetic, excites and reduces spinal reflex excitability, and diminishes the number of cardiac contractions.
16. Meconin is narcotic to cold-blooded animals, but not in doses of two grains by the stomach in man; it causes hyperæsthesia and paralysis of voluntary motion with

general relaxation; it also produces a veratroid contraction. The opium alkaloids all have a dominant action on the nervous system, causing first increased exaggerated functions, and, if the dose is large enough, a paralysis of them. In the warm-blooded animals this action is both on the spinal cord and cerebrum.—*Detroit Lancet*, March.

Thymol.—The essential oils of thyme, of American horsemint and of the *Ptychotis ajowan* contain a substance, a homologue of phenol or carbolic acid, having the composition represented by $C_{10}H_{14}O$, and known as thymol. For more than two years this has been used by German surgeons, and is now being introduced among ourselves. It was discovered in 1719 by Caspar Neumann, examined chemically by Lallemand and Leonard Doveri, and first used to deodorize unhealthy wounds by Bouillon and Paquet, of Lille, in 1868. In 1875 several German surgeons published investigations of its antiseptic properties, which are estimated to be from 4 to 25 times as powerful under certain circumstances as those of carbolic acid. Thymol is a crystalline, nearly colorless body, with a pleasant odor and an aromatic burning taste. Its specific gravity is 1.028, and it melts at $44^{\circ}C$. It dissolves in 1,200 parts of cold water, 1 part of rectified spirit, 120 parts glycerin, and in $\frac{1}{2}$ part of caustic alkalies. Fats and oils also dissolve it readily. It is prepared from the oils of either of the plants before mentioned, but pharmacists should beware of experimenting on English samples of oil of thyme, as but few of them are genuine, or, at least, contain any thymol. The oil is said to yield as much as 50 per cent. of thymol on the Continent. Thymol can be manufactured from these oils by treating them with an equal volume of a 20 per cent. solution of caustic soda, separating the alkaline liquid, and neutralizing with hydrochloric acid, when the thymol will float to the surface. It may also be obtained by submitting the oils to a low temperature for a few days, when the thymol crystallizes out. Its powerful antiseptic action, exceeding under some conditions that of carbolic acid, its small activity as a poison—about one-tenth of that of carbolic acid—and the absence of irritating effect when it is applied to the skin, all point to its use as a substitute for carbolic acid in the now well-known antiseptic treatment of surgical cases elaborated by Professor Lister. This substitution has been made with great success by Professor Volkmann, of Halle. For the spray solution, this gentleman uses a mixture of 1 part thymol, 10 alcohol, 20 glycerin, 1,000 water; but we understand that a solution in water only, which will not deposit, may be made by adding 1 part of thymol to 1000 of hot water. For the gauze dressings used by Professor Lister, others were substituted, made by saturating 1,000 parts of bleached gauze with a mixture of 500 parts spermaceti, 50 resin and 16 of thymol. This prepared gauze is extremely soft and pliant, and, to use the words of the reporter, sucks up blood and the secretions of a wound like a sponge. The fibres of the gauze being impregnated with spermaceti, cannot, of course, become saturated with the secretions, so that they do not become stiff. Thymol has been used for various skin diseases by Dr. R. Crocker, but the results of his experiments have not yet been published. As an internal remedy, thymol does not seem to make much way. It has proved useful in diseases of the stomach, accompanied by fermentation, and Mr. W. H. Stone reports in the "Medical Times and Gazette" that he has found it useful in cases of chorea, one form of

which is St. Vitus' Dance. The present cost of thymol is about five times that of the best carbolic acid, but as one part of the former seems to do as much work as 25 parts of the latter, the advantage of price is on the side of thymol.—*Chem. and Drug*. [London], p. 111.

Acetate of Lead in Large Doses in Post-Partum and Other Hemorrhages.—According to Dr. Workman, acetate of lead, in drachm doses, acts as a uterine motor stimulant to cause firm contraction after delivery of the uterus, thereby preventing post-partum hemorrhage. In hemoptysis also, acetate of lead may be given in half drachm to drachm doses, with very prompt effect. It should be given in solution and the dose repeated, if necessary. No opium should be given with it. In these large doses the acetate of lead usually purges, and thus becomes eliminated from the system. Notwithstanding the prevailing opinion to the contrary, these large doses of acetate of lead are claimed by this author to be perfectly harmless. In corroboration of these statements a number of cases is cited which go to prove the truth of the above statements.—*Detroit Lancet*, March, from *Canada Lancet*, January 1, 1878.

Chloral for Removing Warts.—A solution containing about twenty grains of chloral hydrate to the ounce of water is recommended by Dr. Craig as being effectual for the removal of warts. The operation is said to be painless.—*Detroit Med. Jour.*, Dec., from *Canada Med. Rec.*

The Eucalyptus Globulus.—Professor Samuel Lockwood says, in the "Popular Science Monthly," that the *E. globulus* has earned, by fair experiment, its name of fever-tree, as a preventive, seems now to be settled. Its rapid growth must make it a great drainer of wet soils, while its marked terebinthine odor may have its influence, and it is highly probable that the liberation of this essence into the air stands connected with its generation of ozone. But, whatever the sanatory activities of the eucalypt may be, the fact is squarely settled that spots in Italy, uninhabited because of malarial fever, have been rendered tolerable by the planting of *E. globulus*, and it is believed that a more plentiful planting would nearly, if not quite, remove the difficulty.

The Eucalyptus in Algeria.—Consul-General Playfair writes: "Formerly it was impossible for the workmen at the great iron mines of Mokta el Hadid to remain there during the summer; those who attempted to do so died, and the company was obliged to take the laborers to and from the mines every morning and evening, thirty-three kilos each way. From 1868 to 1870 the company planted more than 100,000 Eucalyptus trees, and now the workmen are able to live all the year through at the scene of their labors."

Extract of Pimentum as a Counter-Irritant.—This preparation has been lauded by some French physicians as a valuable revulsive, not being so fugacious as mustard, nor so irritating as antimony or croton oil. It begins to act in from ten to thirty minutes, according to the delicacy of the skin, causing heat, a slight tingling

and redness, which go on increasing for about three hours, when they remain stationary. The plaster may be applied for eight to ten hours in children, and for twenty to twenty-four in adults. No great irritation capable of impeding occupation ensues, and it may be best compared with that of a sinapism arrived at half its power, and so maintained for the twenty-four hours — *Med. Press and Circ.*, April 3.

Destruction of a Turkish Industry.—Kezanlik, the city of roses, which has not long been relieved from the presence of the marauding Cossack, was until lately the centre of the traffic in attar of roses; but the beautiful plain, with its vineyards and its clumps of walnut trees, and its great gardens of roses, has been passed over four times by alternate waves of battle. The march of armies and bivouacs of 100,000 men have ruined the gardens, and the town itself was lately burned, the Turkish part first, and then the Bulgarian part.

It has been suggested that India is quite able to supply the deficiency, but this is doubtful, and there is a significance in the fact that the price of "rose oil" has made a great leap upwards within the last few weeks, the best being quoted in the British market at 40 shillings per ounce, with every probability of a further advance. Dr. Septimus Plesse, an authority on all matters relating to perfumes, states the average yearly production of attar in the now devastated districts to have been as follows: District of Kezanlik, 1,736 pounds; Gucupso, 754 pounds; Karadja-Bahg, 384 pounds; Yeni-Saghra, 108 pounds; Zoaghra, 98 pounds; say a total of 3,470 pounds, or 55,520 ounces.—*Confectioners' Journal*.

The Rain Tree.—At a recent meeting of the Linnæan Society, Prof. Thistleton Dyer described the "rain tree" of Mogobamba, South America, under the name of *Pithecolobium saman*. The so-called "rain" is the fluid excreta of cicadas which feed on the juices of the foliage, and its dropping is therefore analogous to the "honey-dew" which sometimes drops from the leaves of lime-trees by the agency of aphides.—*Dublin Med. Press and Circ.*, April 17.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, May 21st, 1878.

In absence of the President Mr. Ed. Gaillard was called to the chair, and Mr. J. L. Patterson was elected to act in place of the Registrar, who was engaged in other duty for the college. On motion the reading of minutes of last meeting was dispensed with.

Prof. Maisch exhibited a specimen of *crystallized chloral hydrate* which, when received in this country, two years ago, was colorless, but now had a uniform reddish tinge, intermixed with small spots of a deeper color; as the vial had never been opened all were at a loss to account for such a change.

A specimen of *spiegeleisen* (mirror-iron) was presented to the cabinet; it contains much carbon and manganium and is largely used in the manufacture of cast steel at the present time.

A paper by Mr. E. Gaillard, upon the *impurities of acetic acid* (see page 293), was read and discussed; it was suggested that the proposed test for nitric acid might be shortened by adding an equal bulk of sulphuric acid to the acetic acid and then the ferrous sulphate.

Mr. C. H. Cressler, of Chambersburg, Pa., communicated a paper upon the effects of the rhizome of *Aspidium marginale* (see page 290), and an additional note, by Prof. Maisch, was read describing the plants and rhizomes of the species mentioned, and of *Asp. filix mas*; the papers were accompanied with specimens of the plant and rhizome, sent by Mr. Cressler.

A paper by Mr. J. J. Brown, of Oakland, Cal., upon a *pill excipient*, was read (see page 289), recommending a compound glycerite of starch for the purpose. This induced a conversation upon the subject of glycerin as an excipient for pills, and attention was called to its tendency to absorb moisture, which rendered it unfit for pills containing deliquescent substances, unless an absorbent powder be added.

Prof. Remington exhibited a *graduated minim pipette*, improved by Dr. Squibb; it has a gum nipple attached to the dropping tube, and by immersing the latter in the liquid after pressing out the air the desired amount of liquid will be readily admitted and measured, and can at once be dispensed on again pressing upon the nipple. It is found most convenient to keep such graduated minim pipettes in a wide-mouthed bottle, partially filled with water, thus insuring constant cleanliness. Several of the members present spoke of the superiority of these pipettes over the ordinary minim measures.

There being no further business, on motion, the meeting adjourned.

J. L. PATTERSON, Registrar *pro tem*.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Philadelphia College of Pharmacy.—The Committee on Instruction of the Board of Trustees have had under consideration, for some time past, the advisability of establishing a graded course of instruction. During the past winter the number of students in attendance was so large that the Hall Committee had to provide more seats for their accommodation, in consequence of which nearly all the available space has been occupied by benches. The subject of increased and still better accommodations for the students and the organization of a graded course having been repeatedly before the Board, that body, early in January last, referred the whole subject to the Committees on Instruction and on Property, in conjunction with the professors, and a plan was matured which has received the sanction of the board. Although it will require some time yet to arrange all the details, we may mention the following outlines:

1. The instruction to the junior and senior students will be arranged, with perhaps slight modifications, according to the plan which received the sanction of the "Conference of the Schools of Pharmacy," in 1876 (see "Amer. Jour. of

Pharm.," 1876, p. 471); in the junior department, therefore, the elementary branches will be taught, which will hereafter be omitted from the senior course, thus affording more time in the latter for necessary details and a more extended range of instruction.

2. There will be six lecture hours per week for each class, the same as for the undivided class heretofore. The lectures to the two classes will be on alternate days so as to afford the professors ample time for preparing the necessary specimens, apparatus and experiments in illustration of the lectures.

3. Near the close of February an examination of the junior students will be held; the examination for the degree of Ph.G. will, as heretofore, take place early in March.

4. For admission to the senior course the juniors will be required to successfully pass the examination in *each* branch; those failing in one or more branches, in February, will be granted another examination towards the end of September previous to the beginning of the lectures. Students who have attended one course of instruction in some other College of Pharmacy, before entering the senior course, will be required to prove that they have passed, at such college, an examination in all the branches taught to the juniors, or submit to the examination in the autumn.

5. Students who, previous to the beginning of the lectures in October next, may have attended one full course of lectures in this or another College of Pharmacy, will be entitled to admission to the senior course without previous examination, up to and including the lecture course for 1880-1881.

It will be observed that the adopted modifications in the instruction will vastly increase the labors of the professors, but at the same time afford the students still greater inducements for systematic study and the opportunity of obtaining a more thorough professional education than heretofore.

At the annual meeting of the college, held in March, the subject of a social reception to the members of the college and their ladies had been introduced, and referred to the Board of Trustees, who appointed a committee to make proper arrangements. In the afternoon of May 21st the last pharmaceutical meeting of the session was held, and the evening of the same day had been selected for the reception. About an hour and a half was occupied by Prof. Remington in experimenting with and explaining the use of the oxhydrogen lantern as a means of instruction, and in projecting upon the screen photographic views of landscapes, buildings, works of art, portraits, etc., after which the company repaired to the museum. This had been handsomely decorated with flags and exotic plants from the hot-house of Dr. G. B. Wood, the extensive collections of the college were exposed to view, and in the adjoining library Prof. Maisch's flower garden had been arranged, consisting of the large models of flowers imported a few years ago and used in illustrating his lectures. The centre of the museum hall was occupied with the tastefully arranged refreshments provided for the occasion; a piano had been procured, and music and conversation were indulged in until the company separated. The reception was well attended by ladies, and appeared to please all present to such a degree that many expressed the hope that similar reunions of the members of the College might be arranged from time to time.

Massachusetts College of Pharmacy.—The tenth annual commencement was held last month, in the hall of the Institute of Technology, and was largely attended. After an address by the president, Mr. S. A. D. Sheppard, in which he paid a tribute of respect to the late Ashel Boyden and Daniel Henchman, the first president of the college, the diplomas were conferred upon the following graduates :

Jonathan Marshall Colcord, Mass., *Dialyzed Iron*; Charles Dwight Cooke, Mass., *Analysis of Damiana*; Herbert Augustus Curtis, Mass., *Salicylic Acid*; Edmund Culver Danforth, Mass., *Sodii Sulpho-Carbolas*; Frederick Arthur Hartshorn, Mass., *Saccharated Pepsin*; Charles Huestis Hyde, Vt., *Coffee*; Charles Kenneth Short, N. B., *Petroleum and some of its Products having Pharmaceutical Interest*.

The valedictory addresses were delivered on the part of the faculty by Prof W. P. Bolles, M.D., and in behalf of the graduating class by Mr. J. M. Colcord. After the audience was dismissed, the members of the College, together with their ladies and invited guests, repaired to the Hotel Brunswick, where they partook of the annual dinner.

At the annual meeting held May 2d, the following officers were elected: President, L. C. Flanagan; Vice Presidents—W. W. Bartlett and C. P. Orne; Secretary, S. A. D. Sheppard; Treasurer, John C. Lowd, and Auditor, E. S. Kelly.

Alumni Association of the Massachusetts College of Pharmacy.—An adjourned meeting was held on the evening of May 21st, to act upon some proposed amendments to the constitution; afterwards the Association sat down to the annual supper.

The New Jersey Pharmaceutical Association held its eighth annual meeting in Library Hall, Elizabeth, on Wednesday, May 15th. The meeting was called to order at 10.45 A. M. by the President, Mr. C. B. Smith, who introduced Dr. Green, the mayor of the city. His honor addressed the Association, extending a hearty welcome to the members. The President, on behalf of the Association, returned thanks for the kindness shown.

After reading the annual address by the President, the following officers were elected for the ensuing year: President, Randolph Rickey, of Trenton; Vice Presidents—A. S. White, of Mount Holly, and Robert Eastburn, of New Brunswick; Treasurer, William Rust, of New Brunswick; Recording Secretary, A. P. Brown, of Camden; Corresponding Secretary, R. W. Vandervoort, of Newark; Standing Committee—A. S. White, *ex-officio*, of Mount Holly; Chas. Holzhauser, of Newark; Richard Frohwein, of Elizabeth; Bunting Hankins, of Bordentown, and Franklin Dare, of Bridgeton.

Several papers of interest were read by members.

Princeton was decided on as the place for the next annual meeting, and it was also decided to hold a two days' session; the first day for business, the second to be devoted to reading answers to queries and volunteer papers. A number of new members were elected, and the Publishing Committee were directed to have five hundred copies of the proceedings of 1878 printed, and to send a copy to every druggist in New Jersey. At 5 P. M. the meeting adjourned, the members well pleased with the work of the day.

Pennsylvania Pharmaceutical Association.—The druggists and pharmacists of Reading have held several meetings to secure proper accommodations for this State Association, which will meet there June 11th, at 11 A. M. The American Hall has been selected as the place of meeting, and the American House as headquarters, both located at Fourth and Penn streets.

The Secretary, Dr. J. A. Miller, of Harrisburg, has informed us that he has endeavored to notify by circular every druggist and pharmacist in the State; however, since the notice cannot have reached many who are eligible to membership, we insert here Chap. II, Art. I, of the by-laws, which is as follows:

“Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of pharmacy, chemistry and botany, who may be specially interested in pharmacy and materia medica, are eligible to membership.”

The objects of the Association are expressed in the following Art. II, of the constitution:

“The aim of this Association shall be to unite the educated and reputable pharmacutists and druggists of the State; to improve the science and art of pharmacy, and so restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.”

The initiation fee is \$2; the annual contribution, \$1. Applications for membership may be addressed to the Chairman of the Executive Committee, Chas H. Cressler, Chambersburg. We have learned from the Assistant Secretary, J. H. Stein, of Reading, that by May 15, besides the members, about sixty druggists had signified their intention to be present, and it is hoped that all who are eligible will join, and, if possible, attend the meeting.

Louisville College of Pharmacy.—At the annual meeting held in March the Board of Directors was elected to serve the ensuing year, and afterwards organized as follows: President, C. Lewis Diehl; Vice Presidents, Emil Scheffer and Vincent Davis; Recording Secretary, Fred C. Miller; Corresponding Secretary, C. Tafel; Treasurer, Edward C. Pfingst; Curator, R. Snyder; Directors—John Colgan, John Newman, C. J. Schranz, Jas. A. McAfee and W. W. Smith.

The College had twenty-nine students at the session just closed, five of whom, having passed the examination, received the Degree of Graduate in Pharmacy. The College has just removed to a commodious building of its own, which was purchased last April. The building is situated on one of the principal streets of the city, accessible from all parts of the city by street railway, and within two squares of the post-office and custom-house.

Professor Scheffer has just commenced his lectures of the practical course in Botany to a class of nineteen students, in the new building of the College.

Pharmaceutical Society of Paris.—At the session held April 3d, Mr. Méhu presiding, Mr. Marais directed attention to *subnitrate of bismuth*, which he had recently found to contain lead. The recent researches of Carnot were described by Mr.

Poggiale, according to which 10 or 20 grams of the subnitrate are dissolved in boiling hydrochloric acid, and the solution evaporated nearly to syrupy consistence; a little more acid is added to render the residue fluid, and then several drops of sulphuric acid and 30 or 40 cc. of alcohol. If not sufficiently concentrated, the liquid may become turbid from the partial decomposition of the bismuth chloride, and must be rendered clear by a little hydrochloric acid. After standing for a day, the precipitate is collected upon a small filter, washed with alcohol acidulated with hydrochloric acid, afterwards with alcohol and dried. The filter is first incinerated, then the precipitate is added, moistened with sulphuric acid, heated to redness and the remaining sulphate of lead weighed. In this way he obtained from seven samples sulphate of lead corresponding to between .011 and .098 metallic lead.

Mr. Petit presented a specimen of the alkaloid from *Duboisia myoporoides*, and described its properties (see "Am. Jour. Phar.," May, p. 267). Mr. Lefort suggested that the dichroism of the alkaloid might be due to some impurity. Mr. Petit will continue his investigation.

A note by Mr. Burcker was read, describing a carbonate of uranium and ammonium, and a method for separating the oxides of iron and uranium.

The observations of Mr. Duhomme, that the presence of creatin and creatinin accounted for the anomalous behavior of saccharine urine to Fehling's solution, created some discussion, and led to the appointment of a committee charged with investigating this subject.

EDITORIAL DEPARTMENT.

The "Homes" of Pharmaceutical Colleges.—It is well nigh on to fifty years when the Philadelphia College of Pharmacy determined to secure a permanent home and erected a building on Zane (now Filbert) street, which is still standing, but was sold ten years ago, when the present larger and more commodious hall was erected. Half a century ago, pharmaceutical education in the United States was in its infancy, and it may well have been regarded as a hazardous undertaking on the part of the College to incur a debt which must have weighed heavily upon the then young institution, and for the discharge of which there was then but a slim prospect. We well remember the satisfaction of every member present on the occasion, when one of the most faithful officers of the College reported the result of a life-long service that the institution was free from debt, and thus, freed from a burden, was enabled to look around for more comfortable quarters, the necessity for which had gradually become more apparent.

About a year ago the Maryland College of Pharmacy procured a suitable building, and a few months ago we had the pleasure of chronicling the purchase of a building by the New York College of Pharmacy, which had been seriously crippled by a long law-suit with one of its early members, which, however, was ultimately decided in its favor. And in the present issue we are pleased to record the fact that one of the youngest—the Louisville College of Pharmacy—has followed suit, and secured for itself a permanent "home!"

The pleasing feature in connection with these evident signs of progress is that no aid was asked or received from the cities or States wherein the institutions are located, but that the result has been reached through the liberality of the members and friends of the colleges. We sincerely wish that the other colleges of pharmacy may soon be in a similar position, and secure for themselves that comfort which *can only be found in a "home."*

The Pharmaceutical Examining Board of Philadelphia have recently presented the following report to the Mayor of the city:

To the Honorable William S. Stokley, Mayor:

The Pharmaceutical Examining Board respectfully report that from January 1st, 1877, to April 22d 1878, forty applicants for examination and registration as proprietors of retail drug stores were examined as to their qualifications for conducting the apothecary business. Of this number twenty-six were passed by the Board and duly registered, the remainder being unfitted for the responsible duties of dispensers of poisons and physicians' prescriptions.

Eighty-six clerks appeared before the Board during the same period, of whom sixty-nine received certificates of "Qualified Assistant," authorizing them to be left in charge of a store during the temporary absence of the proprietor. Those who fail to pass a satisfactory examination are granted a second one after the expiration of three months.

The names of seventy-seven retail druggists have been added to the register being entitled thereto, without examination, on account of being graduates of an incorporated college of pharmacy, "whose diploma is based upon a regular term of service in the drug and apothecary business."

The total number of individuals now registered as proprietors of retail drug stores is 692, and 397 qualified assistants have received certificates since the organization of the Board on April 29th, 1872.

The census of drug stores taken last year by your patrolmen developed the fact that over one hundred proprietors were violators of the law in not being registered, and shows the advantage that would arise from an annual inspection of a like character. Notification from the City Solicitor induced the delinquents to apply for examination or registration.

With this report the term of the present Board of Examiners expires by limitation of the Act of Assembly, and they trust that their successors whom you appoint will be enabled to discharge the responsible duties of the position with impartiality and fidelity, so as to assure that protection to the public from incompetent pharmacists which was the object of the law.

Subsequently the Mayor appointed the Board to serve for the next three years, as follows: Messrs. Jas. T. Shinn, Chas. L. Eberle, Rob. England, B. L. Smedley and Wm. C. Bakes. Three of the gentlemen were members of the original Board, appointed in 1872, and have served in that capacity without interruption. It is a well-deserved compliment paid to them by the appointing power. One of the appointees has served for some time on the second Board after the resignation of Mr. Marks, and the fifth gentleman enters for the first time upon these duties.

The Board was organized by electing Mr. Eberle President and Mr. Bakes Secretary.

Pharmaceutical Legislation in Pennsylvania.—The way by which some drafts of laws become the objects of general interest, and acquire historical fame, must be dark indeed. Early in the present year a bill was introduced into the Legislature by Hon. Mr. Ringgold, of Philadelphia, with the avowed object of "regulating the practice of pharmacy and the sale of poisons in the State of Pennsylvania." We have had the privilege of examining that bill after the "Committee on Vice and Immorality," to which it had been referred, had passed judgment on it and, in legislative parlance, had "killed" it. The bill was, indeed, a proper subject for the con-

sideration of the committee named, because, under the disguise of an honest purpose, it displayed a tendency which could not have been better hidden if the bill had been drafted by those whom it would have benefitted, namely, the vendors of diplomas. The main feature of the bill was that no one should be allowed to commence the business of an apothecary, except after showing a diploma to the clerk of a certain court and being registered. No inquiry into the character of the diploma or of the institution granting it was provided for; the passage of the bill would have secured a harvest for diploma mills at home and abroad.

After the defeat of this bill another one was brought forward which, particularly from the second "whereas," leads to the supposition that it emanates from the same source that fathered the first one. This time it was prefaced by an article full of misrepresentations, which had been furnished to and published by a daily paper, and has recently been reproduced, with slight modifications, by a weekly. We now regret that we did not take a full copy of the first bill referred to, but this second one, we think, equally deserves to be preserved, inasmuch as it was printed together with the article referred to above. It is as follows:

At a meeting of the Independent Apothecaries of the city of Philadelphia, held on February 18th, 1873, it was unanimously resolved to lay this matter before the Legislature, and to request that the following bill, which was drafted by a member of the Philadelphia Bar, may be enacted into a law, or a general law passed for the whole State:

AN ACT

To repeal the "Act to Regulate the Practice of Pharmacy, and Sale of Poisons, etc., in the City of Philadelphia, approved April 4th, 1872."

WHEREAS, The Act to Regulate the Practice of Pharmacy, and Sale of Poisons, etc., in the City of Philadelphia, approved on April 4th, 1872, being only a *local* law establishing a "Pharmaceutical Examining Board," should be abolished.

AND WHEREAS, The Act relative to the Sale of Academic Degrees, approved on May 19th, 1871, is a *general* law, and affords ample protection to all the people of all parts of the State of Pennsylvania. Therefore,

SECTION I. *Be it enacted, etc.,* That the "Act to Regulate the Practice of Pharmacy, and Sale of Poisons, etc., in the City of Philadelphia, approved on April 4th, 1872," be and the same is hereby repealed.

OBITUARY.

PROFESSOR JOSEPH HENRY, well known as the Secretary of the Smithsonian Institution, and one of the most distinguished scientists in the United States, died in Washington, D. C., May 13. He was born in Albany, N. Y., December 17, 1797, became a watchmaker, civil engineer and afterwards professor of mathematics in the Albany Academy. He then directed his attention to physics, and more particularly to electricity and magnetism, in which he made several important discoveries. He had held the chair of natural philosophy at Princeton College for fourteen years, when, in 1846, he was called to Washington to draw up a plan for the organization of the Smithsonian Institution, and was subsequently elected secretary or director of it, an office which he held ever since. He served the general government, without extra compensation, as chairman of the light-house board and in other capacities. He was President of the National Academy of Sciences and of the American Association for the Advancement of Education, and he organized a system of volunteer meteorological observations, which subsequently became the basis on which the weather bureau was organized.

THE AMERICAN JOURNAL OF PHARMACY.

JULY, 1878.

EPSOM SALT versus STRAWBERRIES.

By F. H. STORER, *Professor of Agricultural Chemistry in Harvard University.*

The fact that the ripe strawberry is apt to induce constipation seems to be less generally known than it should be; perhaps because the binding action would not naturally be expected, in view of the numerous small seeds of the berry, which might be supposed to promote discharges from the bowels by mere mechanical action.

In this country in particular, where an immense and well nigh universal consumption of strawberries is coincident with the setting in of hot weather, the constipating action of the berry is complicated and, as it were, increased by the excessive waste of water from the body, by perspiration, which occurs at this period; and there can be little doubt that, taking the two causes together, the strawberry season—though perhaps beneficial to some constitutions—is the occasion of much ill health among the American people.

It occurred to me some years since—at the time of Graham's definition of "colloid" and "crystalloid" bodies—that Liebig's argument, that the cathartic action of many saline medicaments is to be referred to their osmotic relations to the membranes of the intestinal canal and the blood vessels, might now be carried on a step further and be made the basis of a rational treatment of constipation.

I argued, in particular, that it might, perhaps, be an easy matter to annul the tendency to constipation which is so noticeable in the hot, dry weather of early summer, by checking or diverting the course of some part of the water which would naturally be exuded by the skin at this season, and causing it to pass into the rectum. The idea was that we might eat or drink habitually small quantities of some harmless indigestible hygroscopic colloid substance, which, while holding water forcibly, could not readily pass through the walls of the stomach or intestines by way of osmose, and would consequently arrive in the

rectum as a liquid, whose presence would hinder the contents of that receptacle from becoming hard. I have never found time to study this conception in its original simplicity, though I think it not unlikely that certain familiar remedies may be found to fall within the scope of it. For example, the use of the fleshy pulp of several fruits which are known to act as laxatives may perhaps be justly regarded as an approximation to the above-mentioned idea. It is not improbable that the pulp-like flesh of prunes and tamarinds contains an inert indigestible colloid substance, or that the advantages derived from the use of these fruits may depend upon the presence and properties of this substance. Perhaps even the sweet pulp of the cassia pods of India may be another example of the same general order.

However this may be, I have latterly had occasion to notice that the action of one, at least, of the mineral waters now in very common use is so closely analogous to that of my proposed medicament that the conception seems worthy of being kept in view, and of being subjected to the test of experiment whenever opportunity may offer.

Indeed, it may be said in general that the osmotic theory of the action of some laxative medicines is so well illustrated by the practical use of certain saline waters, that the fact is worthy of more careful attention and consideration than appears to have been given to it hitherto. The Friedrichshall bitter-water, for example, taken in doses of a small wine-glassful three or four times per day, or five or six times if need be, is an effective bar to the constipations of early summer and to those produced by strawberries; not that the saline water, when taken in the small doses just described, acts as a cathartic, properly so called, but that it carries enough water to the rectum to keep its contents soft.

Analysis¹ of the Friedrichshall water has shown that it contains a variety of salts, some of which may perhaps be useful medicaments in one case and some in another; but for the purpose now under consideration the magnesium salts, which are prominent constituents of this water, would seem to be amply sufficient. I have, in fact, prepared a solution of far less disagreeable taste than Friedrichshall water and equally effective with it against the kinds of constipation here in ques-

¹ "Jahresbericht der Chemie," 1847-48, p. 1002; from "Annalen der Chemie und Pharmacie," lxi, 127.

tion, by simply dissolving 15 grams of Epsom salt and 8 grams of common salt in a champagne bottle (quart) full of water.¹

In how far the presence of the common salt may be essential to the efficacy of this mixture I am not prepared to say. I added it on the conjecture that a solution containing a chloride as well as a magnesium compound might perhaps serve a better purpose than sulphate of magnesium by itself.

The common salt has at least the merit of abating or disguising to an appreciable extent the disagreeable taste² of the Epsom salt.

As for the mode of action of these small doses of saline matters, it would seem to admit of ready explanation on the old theory that the salts tend to detain the water in which they are held dissolved. That is to say, the salts hinder the water from passing through the walls of the intestines by way of osmose, and consequently carry into the rectum a certain amount of water, which but for the presence of the salts would naturally have been discharged through the skin. Since the magnesium salt is a crystalloid and not a colloid body, part of it undoubtedly passes into the blood, and some of it passes through the kidneys and is discharged with the urine; but a certain quantity does, nevertheless, go into the rectum, carrying with it enough water to keep the contents of that receptacle moist.

It is to be borne in mind, of course, that in using these continuous small doses of the magnesium salt we undoubtedly produce some other physiological effects which are known to attend the use of this medica-

¹ A small wine-glassful of this solution may be taken on going to bed at night, on getting up in the morning, in the middle of the afternoon, and of the forenoon also, if need be; or more frequently still, in case the foregoing doses should prove to be insufficient. Sometimes, on the other hand, a couple of doses will be all-sufficient, taken at night and morning.

It may here be said that in a preliminary trial, or mixture of 100 grams Epsom salt, 8 grams crystallized chloride of magnesium, 12 grams Glauber salt and 8 grams common salt, to the quart of water, was found to be too strong.

It is noteworthy that the solution described in the text contains a much smaller amount of saline matter than the sum of the matters contained in the Friedrichshall water, as indicated by the analysis above cited.

² I have noticed in several instances that the taste of the mixed solution has improved on standing; that is to say, a slight but peculiar disagreeable taste was noticeable in the freshly prepared solutions that could not be detected in solutions that had been kept a week or more.

ment. There will be a certain amount of diuretic action, doubtless, in addition to the laxative, and perhaps some manifestation of the cooling or anti-inflammatory influence which has led, at one time and another, to the employment of Epsom salt in the treatment of fevers and inflammations. But these results are evidently of no great consequence to a healthy person. The only unpleasant doubt that suggests itself is in connection with the diuretic movement, namely, whether there may not be some danger in continually bringing into the bladder an unnaturally large quantity of magnesia, lest it should there enter into insoluble combination with the phosphates of the urine. But it is none the less true that the ability to prevent occasional constipation by means of salts so simple and so nearly harmless as the mixture here described will be of much advantage in many cases.

The salts here in question can be obtained almost everywhere, and may readily be carried about in traveling, in the form of dry powders, to be dissolved in water at the moment of use or whenever they may be needed.

Note by the Editor.—Prof. Storer's paper has recalled to our mind several cases which appear to sustain his views. In a case of external piles, well advanced in the forming stage, magnesium sulphate was selected, not so much on account of its laxative action, as rather for its well known property of absorbing and retaining water in the intestinal canal. A solution was made containing in each fluidounce half an ounce of the salt, and this was regularly taken before breakfast. The commencing dose, half a fluidounce, containing 120 grains of the salt, had to be reduced in a few days to one-half, and was during the following two or three months very gradually lessened to f3ss, and finally discontinued, having effected a cure, or rather prevented a further enlargement of the distention. We are informed that during the twenty years which have since passed by there has been no necessity for repeating the treatment.

Another case of very recent occurrence is one of chronic constipation in an aged person, requiring the frequent use of active cathartics, and in which milder laxatives, like confection of senna, were of no avail. A similar solution of magnesium sulphate was made and taken in doses commencing with half a fluidounce. The dose was perhaps too rapidly reduced to a fluidrachm; for the latter dose soon failed to accomplish its object, and had to be increased again to a tablespoonful.

DANGEROUS HYDRARGYRUM CUM CRETA.

BY ELWOOD G. HENDRICKS, PH.G.

So much has been said and written on this subject that every pharmacist should know the danger of this preparation when not properly made, and the changes it undergoes when in contact with the atmosphere. My attention was attracted not long ago in a pharmacy to the upper shelf, where there was an array of 8 oz. salt-mouth bottles, containing various preparations, among them one containing hydrargyrum cum creta, probably about three ounces. Near the bottom I noticed a peculiar coloration, and on closely examining it observed that about one-sixth of the whole quantity in the bottle had undergone the change and formed red oxide of mercury. The proprietor had two stores, and in this one he also kept on hand a small 2 oz. bottle to supply the dispensing counter; yet serious results might happen in case a new or younger assistant should be left in charge of the store.

In speaking with a physician of Northumberland county, he informed me that he had used the preparation of mercury and chalk very often with bad results, viz., producing vomiting and gastric irritation, and very dangerous symptoms. He afterwards spoke to a neighboring physician about the preparation, and learned that he also had experienced the same results; both have not prescribed it for nine years.

A very interesting and instructive article on commercial hydrargyrum cum creta, by Prof. J. P. Remington, was published in the "Am. Jour. Phar.," 1869, p. 43, in which he speaks of Dr. Squibb's process for preparing this officinal article with honey, which prevents the oxidation of the metallic mercury, and it is to be hoped that all pharmacists will pay more attention to this valuable preparation which, through carelessness in preparing or keeping, may become such a dangerous article.

NOTE.—The editor agrees with Prof. Procter's opinion appended to the paper referred to, "that this preparation as made by the officinal process should be abandoned, and a new formula adopted, containing saccharine matter, as in blue mass." Mr. Bibby's process, published in this journal, 1876, p. 269, appears to be well adapted for pharmacists who prefer making their own preparations, and we invite readers who may have had practical experience with this or another reliable process, to communicate the same.

EMULSIONS.

BY PH. H. DILG, PH.G.

In preparing emulsions, German apothecaries generally employ the relative quantity of gum and oil official in the German Pharmacopœia ; many differ, however, in regard to the exact proportion and time of adding the first portion of water. Some mix at once 4 parts of water, 4 of oil and 2 of gum ; others first mix 4 parts of oil with 2 parts of gum, and then add 4 parts of water at once ; still others follow either one of the above methods, with the exception of using only 3 instead of 4 parts of water as the first portion. I have experimented with each one and came to the conclusion that, though there is no material difference in the result, the second is the most advantageous mode. It is preferable to the first for being less liable to afford the gum, especially when in fine powder, opportunity to clog, and it is more easily manipulated than the third method, since the larger amount of water facilitates the division or spread of each particle of gum, thereby expediting the thorough combination of the mixture. After mixing intimately half as much gum as a given quantity of oil or balsam, add at once the same quantity of water as oil, and triturate until a crackling noise is produced, which indicates that the oil is thoroughly emulsified and will bear any amount of dilution ; it is one of the principal points to be observed in following the German process. As far as permanency and pure milkiness are concerned there is probably no superior emulsion made ; it has, however, the decided disadvantage of requiring too much gum. Therefore, whenever a larger amount of oil is required to be emulsified, it is advisable to use the method which has found much favor, at least among Philadelphia druggists, namely, forming a mucilage and adding oil gradually, with much less gum than is generally used. I have succeeded in making perfect emulsions, which will remain so as long as extemporaneous mixtures are generally expected to stand without separating, namely, about a week, when they will commence to separate into layers, without liberating the oil, and a slight shake will recombine them. I make a mucilage with f̄iv water and ʒi gum and gradually (not necessarily slowly) add f̄iii oil ; after these are well combined enough water is added to make f̄xii, after which the mixture will bear copious dilution. It is a mistake to think that the mucilage must be *thick*, as this renders it necessary to add the oil and balance of water *alternately*. In trying

to make the same emulsion, using only fʒii water to begin with, I have found that, before half finished, it became granulated, and required additional water to spread the gum sufficiently so as to combine smoothly with all the particles of oil. I have made emulsions of cod liver oil, copaiba, castor oil and oil of turpentine, by this method, with very satisfactory success.

MEDICATED SYRUPS.

BY ISAAC DAVIS, PH.G.

Abstract from an Inaugural Essay presented to the Philadelphia College of Pharmacy.

The author refers to some of the disadvantages of preparing syrups by boiling, and afterwards to Mr. Orynski's process for preparing syrups without heat ("Proceedings Amer. Phar. Assoc.," 1871, p. 451). *Simple syrup* was prepared by placing 36 troyounces of granulated sugar in a conical glass percolator upon a perforated diaphragm covered with a piece of linen, and gradually pouring distilled water upon it until the sugar was dissolved and the syrup measured 44 fluidounces. The result was quite satisfactory; however, the application of the same process in the preparation of other syrups was not equal in its results to those obtained with the following process:

Syrupus scillæ, made by the officinal process, becomes cloudy and separates a flocculent albuminous matter, but a permanently clear and transparent syrup is obtained by making a mixture of 2 fluidounces of acetic acid and 30 of simple syrup, adding of this mixture sufficient to 2 troyounces of squill in moderately fine powder to obtain a thin paste, and setting it aside for four hours to allow of the swelling of the squill; it is then introduced into a conical glass percolator in the neck of which a piece of wet sponge has been placed; the surface is covered with a disc of paper and the mixture poured upon it; after this has disappeared from the surface, three fluidounces of simple syrup are added, and the last portion of the syrup may be displaced by water, gradually poured on, until the percolate measures two pints.

Syrupus Pruni virginianæ.—Mix 5 troyounces of wild cherry bark in moderately coarse powder with 2 fluidounces of simple syrup, set aside for 24 hours in a close vessel, then transfer it to a conical glass percolator, and gradually pour upon it 30 fluidounces of syrup and afterwards sufficient water to make the percolate measure 32 fluid-

ounces. Prepared in this manner, syrup of wild cherry bark is an elegant transparent syrup, having in a very marked degree the odor and taste of the bark.

Syrupus Senegæ.—Mix 1 fluidounce of alcohol with 15 fluidounces of syrup, and with 2 fluidounces of this mixture moisten 4 troyounces of senega in moderately coarse powder, transfer this to a conical glass percolator, and gradually pour on it the mixture of alcohol and syrup, and when this has passed through, sufficient syrup to make the percolate measure 1 pint. Thus prepared, the syrup has the odor and taste of the root very decidedly.

In the same manner, using a mixture of 1 fluidounce of alcohol and 15 of syrup, were prepared

Syrupus rhei from 720 grains of rhubarb, in moderately coarse powder ;

Syrupus rhei aromaticus, from 120 grains of rhubarb, 15 grains of nutmeg and 30 grains each of cinnamon and cloves, all in moderately fine powder ;

Syrupus ipecacuanhæ, from 1 troyounce of ipecac ;

Syrupus sarsaparillæ compositus, from 3 troyounces of sarsaparilla, 180 grains of guaiacum wood and 120 grains each of pale rose, senna and liquorice root ; 3 drops of oil of anise and 2 drops of oil of gaultheria are dissolved in the percolate ;

Syrupus scillæ compositus, from 1 troyounce each of squill and senega ; 12 fluidounces of percolate are obtained and mixed with a solution of 12 grains of tartar emetic in 2 fluidrachms of hot water.

Syrupus kramerizæ, from 3 troyounces of rhatany, in moderately fine powder.

Several of the syrups were also prepared without the addition of the fluidounce of alcohol, which, however, the author does not consider objectionable, but, on the contrary, preferable. Although it takes a longer time to prepare a syrup in this manner than by the officinal process, the one suggested is claimed to yield better results because no injury by heat can occur, and because no principle is taken up in the early part of the process to be discarded and filtered out towards the end. The essay was accompanied by specimens of the syrups prepared in September, 1876.

NOTES ON FLUID EXTRACTS.

BY ALONZO ROBBINS, PH.G.

The subject of fluid extracts deservedly continuing to attract the attention of pharmacists, the following experiments were undertaken with the hope that they might throw some light on the question, at least so far as concerned the drugs operated upon.

The substances chosen for the experiments were senna and seneka ; the senna was used in No. 40 powder, and the seneka in No. 50. The menstruum employed for the senna was made of 1 part alcohol, sp. gr. .822, and 2 parts water. The menstruum used for the seneka was composed of 150 parts alcohol, .822, 150 parts water and 10 parts water of ammonia. Parts by weight were used throughout. The use of parts by weight and the adoption of 100 parts of the drugs as the standard number to be taken, which allows the results to be read as percentages as well as parts, presents its advantages so plainly that it can hardly fail of approbation.

The percolators used were of glass and made specially for these experiments. They were 14 inches high, $3\frac{3}{4}$ inches diameter at the top and $\frac{3}{4}$ inch at the bottom. When in use the lower orifice was closed with a perforated cork, to which was fitted a glass tube $\frac{3}{16}$ inch diameter and 2 inches long. To the glass tube a rubber tube 3 inches long was attached, and on this was placed a pinchcock to control the rate of percolation and to stop it entirely during maceration.

Moistening and Packing of the Powder.—To 100 parts of the powdered drug from 35 to 40 parts of menstruum were added and thoroughly mixed, and the mixture passed through a No. 18 sieve. The lower end of the percolator was closed with a cork, and on this was placed a loosely-fitting plug of cotton. The moistened powder was now introduced in small portions, each portion being well shaken down, and when all was in it was rather firmly packed with a pestle ; the surface of the powder was then covered with a thin layer of cotton, which was kept in place by two or three glass stoppers. The cork was now removed from the lower aperture, and the perforated cork containing the glass tube put in place and the percolation proceeded with as described. By means of the pinchcock the rate of dropping was kept at from 4 to 8 drops per minute. All of the percolators were provided with close-fitting covers. One hundred grams of the moistened powder,

when packed in the percolator, occupied a space from $7\frac{1}{2}$ to 8 inches high.

A series of four fluid extracts was made from each drug and the results arranged in tabular form, the better to allow a comparison to be made of the various stages of the process. On another more condensed table is shown the rate or percentage of exhaustion in those experiments in which the percolates were taken in twenty portions. 100 grams of powder was used for each experiment.

Experiment No. 1.—As soon as the powder was packed menstruum was added, and the percolation allowed to proceed at once without maceration. The percolate was taken in portions of 25 grams each until 20 portions or 500 grams in all had been obtained, then the percolation was continued until 500 grams more had passed, which was collected in one portion.

Experiment No. 2.—When the powder was packed menstruum was added, and when the percolate appeared in the cotton plug the lower aperture was closed and maceration continued four days, and then the percolate was taken in portions as in experiment No. 1.

Experiment No. 3 was intended to show what effect repeated maceration would have in the exhaustion of soluble matter from the substances operated upon. When the percolate appeared in the cotton plug the lower aperture was closed, and maceration was continued four days, then 25 grams of percolate was obtained, and then the percolator again closed and maceration continued three days, when 25 grams more of percolate was obtained; the percolator was now closed for two days, and then 25 grains percolate obtained. It was now closed one day, and then allowed to proceed without interruption until the full number of 20 percolates were obtained and the final 500 grams.

Experiment No. 4.—This experiment was intended to corroborate the results obtained by experiment No. 1. The percolation was allowed to proceed without maceration, and at a more rapid rate; the percolate was taken in two portions of 500 grams each. The greater specific gravity shown by this fluid extract is not due to its containing more dry extract than the others, but is caused by the entire percolate being evaporated until reduced to 100 parts, thereby driving off all or nearly all of the alcohol, while, in the other experiments, the first 75 parts of percolate were reserved and not subjected to any evaporation.

No.	Name.	100 grams of drug used in each experiment.								Dry Extract in 500 grams Dilute Percolate.	Total Dry Extract obtained.	Specific Gravity of the Fluid Extract.	Specific Gravity of Menstruum at 72°F.
		13th.	14th.	15th.	16th.	17th.	18th.	19th.	20th.				
1	Senna	'09	'09	'08	'07	'06	'05	'05	'05	'75	35'33	1'095	'954
2	"	'18	'15	'13	'12	'09	'04	'05	'04	'50	35'32	1'095	'954
3	"	'22	'15	'12	'09	'08	'05	'04	'04	'50	35'48	1'106	'954
4	"									'25	35'25	1'142	'954
1	Seneka	'25	'18	'13	'13	'12	'11	'08	'05	1'00	41'01	1'086	'926
2	"	'25	'19	'12	'25	'15	'14	'10	'05	'25	42'21	1'098	'926
3	"	'35	'28	'15	'14	'15	'11	'10	'08	'50	42'06	1'095	'926
4	"									'50	40'00	1'104	'926

Rate of Exhaustion.

No.	Name.	1st 5 Percolates.	2d 5 Percolates.	3d 5 Percolates.	4th 5 Percolates.	500 grams Dilute Percolate.
1	Senna	30'25	3'55	'50	'28	'75
2	"	30'33	3'17	'98	'34	'50
3	"	30'50	3'14	1'04	'30	'50
1	Seneka	34'25	4'01	1'26	'49	1'00
2	"	33'25	6'50	1'52	'69	'25
3	"	33'25	6'13	1'60	'58	'50

In the following formulas for fluid extracts in view of the results shown by the foregoing tables I have omitted maceration for the seneka and retained it for senna. Direct percolation really appears to be best for seneka, and probably for some other drugs, but I believe that in most cases maceration would be advantageous.

Fluid Extract of Seneka.

Take of Seneka, in powder No. 50, . . . 100 parts
 Water of ammonia,
 Alcohol, s. g. '822,
 Water, each, . . . a sufficient quantity.

Mix 150 parts each of alcohol and water, add 10 parts water of

ammonia, and, having moistened the seneka with 35 parts of the mixture, put it into a narrow conical glass percolator in small portions, each portion being well shaken down, and when all is in pack firmly with a pestle, cover the surface of the powder with a layer of cotton, which keep in place by two or three glass stoppers, and gradually add the menstruum. When the percolate amounts to 75 parts expose it in a shallow dish to the open air until it has lost about 5 parts, or until the odor of ammonia is no longer perceptible. Continue the percolation with the same menstruum until the seneka is exhausted ; evaporate this percolate by means of a water-bath to 30 parts, mix it with the reserved portion, and make up the quantity to 100 parts with alcohol.

This fluid extract is quite dark in color, forms no deposit on standing and remains clear when mixed with simple syrup to make syrup of seneka.

If the percolation proceeds slowly the odor of ammonia will not be perceptible in the 75 parts of reserved percolate, but it was thought best to expose it to spontaneous evaporation to make sure that no free ammonia should be present in the finished preparation. The addition of an alkali to the preparations of seneka is by no means original ; it has been previously suggested by Prof. Procter and Mr. Bullock ("Am. Jour. Phar.," 1862, p. 136), by Dr. Squibb ("Proceedings Am. Pharm. Assoc.," 1871, p. 454), by Prof. Markoe ("Proceedings Am. Pharm. Assoc.," 1873, p. 519) and by Prof. Maisch. The first two gentlemen added bicarbonate of potassium to the fluid extract ; Dr. Squibb used ammonia ; Prof. Markoe did not specify what alkali, and Prof. Maisch used bicarbonate of sodium. I was led to the use of water of ammonia by the ease with which, owing to its volatility, any excess might be removed.

Fluid Extract of Senna.

Take of Senna, in powder No. 40,	.	.	100 parts
Alcohol, s. g. '822,			
Water, each,		a sufficient quantity.	

Mix 50 parts of alcohol with 100 parts of water, and moisten the senna with 35 parts of the mixture, mix well and pass through a No. 18 sieve, then put into a narrow conical glass percolator, in small portions, each portion being well shaken down, and when all is in pack firmly with a pestle, cover the surface of the powder with a layer of cotton, which keep in place by two or three glass stoppers ; add the

menstruum, and when the percolate appears in the cotton plug at the orifice close the percolator and macerate 48 hours, then allow the percolation to proceed until 75 parts of percolate have been obtained, which set aside, and continue the percolation until the senna is exhausted; evaporate this percolate by means of a water-bath to 25 parts, and mix it with the reserved portion.

Wishing to ascertain the value of the use of glycerin in fluid extract of senna, three fluid extracts were prepared, differing only from the above in containing respectively 10, 15 and 25 per cent. of glycerin, which was added to the dilute percolates previous to evaporation. For that sample containing 25 per cent. of glycerin only 60 parts of percolate were reserved. Too short a period has elapsed since their preparation to justify an opinion as to the effect of time on these samples, but at present my belief is that glycerin is of no service in fluid extract of senna.

In regard to repercolation, it is probable that the additional labor and trouble of the several packings and percolations required by that process may be quite equaled by the labor and trouble of evaporation required by the process of simple percolation; the remaining dilute percolate may also represent what usually disappears into the air during evaporation in simple percolation. If some modification of the process of repercolation could be made which would do away with the necessity of any dilute percolate remaining over, I have no doubt about its greatly contributing to the general adoption of that process. Having no practical experience with repercolation, I am reluctant to suggest a modification of it, but it appears to me that if 100 parts of drug were taken and divided into three equal portions, and 25 parts of reserve percolate obtained from each of the first two portions and 50 parts from the remaining portion, and then stop, a near approach to at least practical exhaustion would be made. There would certainly be some loss, but as the 50 parts of final percolate would be obtained from $33\frac{1}{3}$ parts of drug that loss could not seriously affect the activity of the preparation.

I hope that in the next U. S. Pharmacopœia both processes may be made officinal, thereby allowing pharmacists to use whichever they may prefer.

Philadelphia, June 17th, 1878.

E ACTIVE CONSTITUENTS OF ERGOT.

BY PHIL. H. DILG.

Ergot has been frequently the subject of investigation previous to the discovery, by Wenzell, of the alkaloids ergotina and ecbolina, to the last of which the effects of ergot were supposed to be due ("Am. Jour. Pharm.," vol. xxxvi, p. 193, 1864). Since then the same author, in 1872, has published a modified process for obtaining his alkaloids, and a host of other investigators have made known their results. The most recent publications are two interesting and exhaustive papers, throwing much light upon the hitherto somewhat obscure and rather complicated literature of ergot, viz., "Ueber die wirksamen und einige andere Bestandtheile des Mutterkorns" (on the active and some other constituents of ergot), by Dragendorff and Podwissotzky, reprint from the "Archiv für experim. Pathol. und Pharmacol.," vol. vi, 1876, and an inaugural essay for the degree of "Master of Pharmacy," by Theo. Blumberg, entitled "Ein Beitrag zur Kenntniss der Mutterkorn-Alkaloide" (a contribution to the knowledge of the ergot alkaloids) Dorpat, 1878. The following is a brief summary of what appears to me to be the principal results obtained by these authors with the most important constituents of ergot:

Though long known that ergot yields its active principle to cold water its precise nature has for many years been a subject of continued controversy. It is principally due to the united efforts of Prof. Dragendorff and von Podwissotzky, of the Pharmac. Institute of the University of Dorpat, that it has now been proven that the most active constituent is an acid termed *sclerotic acid*, which is present in combination with K, Na and Ca, which salts are freely soluble in water. It is, however, rivaled in action, both qualitatively and quantitatively, by a colloidal substance, *scleromucin*, which is obtained in connection with the acid in the following manner: Digest ergot, previously exhausted by ether and absolute alcohol, with water, dialyze, evaporate the dialyrate to a syrupy consistence, and treat with sufficient alcohol to obtain a mixture containing 40 to 45 per cent. alcohol, which precipitates the potassium phosphate; while more alcohol added until the strength is increased to 75 or 80 per cent., precipitates the salts of sclerotic acid, which are soluble in dilute but insoluble in stronger alcohol, and leave about 19 per cent. of ash.

The filtrate, upon which alcohol has no further effect, produces with

ether a slight precipitate, which after a few days' standing forms a syrupy, brown mass, which has scarcely any medicinal virtue. The filtrate from this precipitate, in which the reactions still distinctly indicate the presence of Wenzell's alkaloids, after evaporating the ether and alcohol, does *not* produce the specific action of ergot.

The dark liquid remaining on the dialyzator, when mixed with sufficient alcohol to bring it to 45—50 per cent., precipitates the *scleromucin*, which while moist forms a mucilaginous solution with water, but after drying is only partially soluble, differing in this respect from sclerotic acid, which is soluble, in all proportions, before and after drying.

Sclerotic acid is obtained in a nearly pure state by kneading the mixed sclerotates as obtained above, with 80 per cent. alcohol, and afterwards dissolving them in 40 per cent. alcohol; the solution is mixed with an excess of hydrochloric acid, and after several hours precipitated with absolute alcohol, whereby the ash is reduced to about 3 per cent., and consists mainly of some silica, manganium, and phosphates of iron and potassium. The acid is not a glucoside, and yields no precipitates with the reagents for alkaloids, except with phosphomolybdic acid a yellow, and with tannin a nearly colorless one. Sclerotic acid is obtained as a yellowish-brown, tasteless and inodorous substance, which has a very slight acid reaction, and is hygroscopic without being deliquescent. It is very well adapted for subcutaneous appliances, in doses of 0.03—0.045 gram.

Scleromucin is darker in color, slightly hygroscopic, gummy, inodorous and tasteless; yields 26.8 per cent. of ash, and, like sclerotic acid, contains nitrogen, is not a glucoside, and is precipitated by tannin and phosphomolybdic acid.

Good ergot yields about 4 to $4\frac{1}{2}$ per cent. of sclerotic acid, and about 2 to 3 per cent. of scleromucin.

In the commercial extracts the acid is found in variable quantities, depending on the strength of alcohol used in their manufacture. Scleromucin is generally not present, except sometimes in very small quantities, as, for instance, in Bonjean's ergotin, which contains considerable sclerotic acid.

The following coloring matters have been isolated from ergot: yellow crystalline scales of *scleroxanthin*, in combination with the pale yellow needle-like crystals of its anhydrid termed *sclerocrystallin*; also an amorphous mass, soluble with difficulty in ether, alcohol and chloro-

form, to which the name *scleroiodin* has been given. By far the most important coloring matter, however, is *sclererythrin*, to which the characteristic reactions of ergot are due, which were erroneously ascribed to a ferruginous substance supposed to be allied to the coloring principle of blood.

If ergot is exhausted by ether or alcohol, and then treated with acidulated alcohol or ether, *sclererythrin* will be liberated from its calcium compound and produce a red solution. Diluted solutions of alkalies and alkaline carbonates dissolve *sclererythrin*, with a beautiful murexide color. Ether agitated with this solution is not colored, but after neutralizing with an acid a delicate and characteristic reaction occurs, by imparting a red-brown color to the ether. Alcohol or ether will not dissolve the *sclererythrin* directly from ergot, unless the drug be previously acidulated.

In connection with the above investigations, Dragendorff and Podwissotzky isolated a bitter alkaloid, which they call *picrosclerotin*, and a yellow acid, which they named *fuscosclerotic acid*. They were obtained in purifying *sclererythrin*, by precipitating its alcoholic solution with lime water, when *picrosclerotin* and *fuscosclerotate* of calcium remained in solution; on the addition of dilute sulphuric acid and agitating with ether, this solvent took up the *fuscosclerotic acid* and left nearly all *picrosclerotin* behind, which is readily dissolved by acetic or sulphuric acid and reprecipitated by ammonia.

A solution of the amorphous alkaloid subcutaneously injected was observed to produce in frogs decreased sensibility, paralysis of the extremities, and in 10 or 12 minutes death, without convulsions. Blumberg noticed that *picrosclerotin* is colored violet by oil of vitriol, and that in the isolated state it rapidly loses its activity, forming a resinous mass, which is insoluble in acetic and dilute sulphuric acid, and colored brown by oil of vitriol. It is identical with the resin obtained by Ganser (1870) from the fixed oil of ergot, from which Blumberg isolated also a crystalline alkaloid, closely allied and probably identical with *picrosclerotin*.

As above stated, the filtrate showing the reactions of Wenzell's alkaloids proved to be destitute of medicinal action; Dragendorff and Podwissotzky isolated the alkaloids by Wenzell's process from this filtrate as well as directly from ergot, and found that both *ergotina* and *ecbolina* are precipitated by corrosive sublimate from their concentrated

solutions, and that both contain admixtures of different salts and foreign matters. Blumberg has made the same observation, and agrees with Dragendorff in regarding the two as only one alkaloid, which is but partially precipitated by corrosive sublimate, since its compound with the latter is not insoluble in water, the solution being, however, precipitated by phosphomolybdic acid.

Blumberg has also isolated the crystalline alkaloid *ergotinina* observed by Tanret in 1875. The oil of ergot, obtained by extraction with ether, is repeatedly agitated with water acidulated with sulphuric acid, and the acid solution rendered alkaline by carbonate of sodium. The precipitate may be dissolved in ether or in absolute alcohol, which solutions on being concentrated yield crystals of *ergotinina*. These are colored violet-blue by oil of vitriol, and by Froehde's reagent at first violet, then soon blue, finally blue-green, and on heating olive-green. *Ergotinina* soon decomposes, forming a resinous mass, and when in solution, injected subcutaneously, produced in frogs effects very similar to those observed from *picrosclerotina*.

Philadelphia, June 12, 1878.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

The Relation of Chemical Compounds in Volatile Oils.—Volatile oils consist either of several carbohydrogens or of carbohydrogens and oxygenated substances, among which there is a certain relation noticeable, as is seen from the following list:

Oil of Dryobalanops Camphor, $C_{10}H_{16}, C_{10}H_{18}O$.

Caraway, $C_{10}H_{16}, C_{10}H_{14}, C_{10}H_{12}O$.

Thyme, $C_{10}H_{16}, C_{10}H_{14}O$.

Dill, $C_{10}H_{16}, C_{10}H_{14}O$.

Caraway, $C_{10}H_{16}, C_{10}H_{14}O$.

Eucalyptus, $C_{10}H_{16}, C_{10}H_{14}, C_{10}H_{16}O, C_{10}H_{14}O$.

Sassafras, $C_{10}H_{16}, C_{10}H_{10}O_2$.

G. Bruylants has endeavored to determine the relation of the constituents of oil of tansy and of valerian, with the following results:

Oil of tansy contains about 1 per cent. of a terpene, $C_{10}H_{16}$, boiling between 160 and $165^{\circ}C.$, about 26 per cent. of an alcohol, $C_{10}H_{18}O$, boiling near $205^{\circ}C.$, and about 70 per cent. of the aldehyd *tanacetyl hydride*, boiling at $195^{\circ}C.$ and forming a crystalline compound with bisulphite of sodium.

Oil of valerian was found to contain a terpene, $C_{10}H_{16}$, the alcohol *borneol*, $C_{10}H_{18}O$, the ether of the same, $(C_{10}H_{17})_2O$, and the formic, acetic and valerianic ethers of the same, the latter having the formula $C_{10}H_{17}C_5H_9O_2$.

The seeds of *Euphorbia Lathyris*, *Lin.*, are known in Europe as *semen cataputiae minoris*. O. Zander obtained from them by treatment with bisulphide of carbon, 42 per cent. of a yellow, clear, fixed oil. 5 drops of it, taken in water, caused a lasting burning pain in the throat, followed by nausea, vomiting, and finally strong purgative effects. Applied externally it caused a burning sensation, which induced the author to believe that it might be advantageously employed as a substitute for the more expensive Croton oil.—*Archiv der Pharmacie*, March, 1878, p. 211.

Agaricus atrotomentosus.—By extracting this agaric with ether W. Thoerner obtained a beautiful wine-red liquid, and after evaporating a dark brown shining crystalline mass, which was purified by boiling with an alkali, acidulating the solution, separating the precipitate by filtration, and recrystallizing from boiling alcohol. The purified compound forms dark brown scales having a metallic lustre; dissolving in alcohol with a wine-red and in alkalies with a yellow color. It is insoluble in water, ligroin, benzol, chloroform and carbon bisulphide, and with difficulty soluble in boiling alcohol and glacial acetic acid. It appears to be a dioxykinon, $C_{11}H_6O_2(OH)_2$, and probably a derivative of a carbohydrogen, $C_{11}H_{10}$.

The same author has obtained from this agaric and from *Ag. bulbosus* and *Ag. integer* beautifully crystallizing double salts of platinum, with one or more alkaloids, and from *A. integer* also a considerable quantity of mannite.—*Ber. Deutsch. Chem. Ges.*, 1878, p. 533.

Extraction of Morphia.—Dr. Eugene Buri, referring to Stas-Otto's method, in which morphia is dissolved in amylic-alcohol, and after evaporation left in an amorphous condition mixed with impurities, likewise soluble in amylic-alcohol, suggests to evaporate this solution spontaneously in a watch-crystal, or if too bulky to evaporate it to dryness on a water-bath, treat the residue with about 1 or 2 cc. of acidulated water, pour off from the insoluble residue, supersaturate with ammonia, shake again with 2 or 3 cc. of amylic alcohol, and allow the latter to evaporate, as stated above; the residue will then consist of pure crys-

tals of morphia, while the impurities, if any are present, will form an amorphous ring on the outer edge of the glass.—*Ztsch. Anal. Chem.*, 1878, p. 185.

Phosphorus found in a Corpse Six Weeks after Death.—Dr. Elvers tells us that an analysis made of the intestines of a woman who had died under very suspicious circumstances six weeks before, proved the presence of 0.07 gram of phosphorus in the alimentary canal, which had been administered to her in soup prepared by her daughter-in-law. In connection with the analysis it was shown that water, macerated with phosphorus paste for some time, will hold a considerable amount of phosphorus suspended as a very fine powder, the mixture resembling an emulsion in appearance, and precipitating the phosphorus very slowly.—*Ztsch. Oest. Apoth. Ver.*, May, 1878, p. 224—*Vierteljähressch. f. gerichtl. Med.*

Colored Artificial Sago.—G. C. Wittstein states ("Dingl. Pol. Journ.") that artificial pearl sago prepared from potato starch often appears colored. A sample left 0.7 per cent. of ashes, 0.4 of which were found to consist of oxide of iron.—*Schw. Wochenschr.*, 1878, p. 132.

Chinese rice paper is not really a paper, but consists of the pith of the stems of *Aralia papyrifera*, cut with large and very sharp knives either radially into small, or spirally into large layers, as thin as paper, which are pressed smooth and are used in China for delicate aquarell paintings, and in Europe in the manufacture of artificial flowers, etc.—*Pharm. Centralb.*, May 9, p. 182.

Glacialin is the name of a preserving liquid, consisting of a solution of 9 parts boracic acid, $4\frac{1}{2}$ parts borate of soda, 3 parts sugar, and $4\frac{1}{2}$ pts. glycerin, in about 200 parts water.—*Pharm. Zeit.*, May 11, 1878.

GLEANINGS FROM THE FRENCH JOURNALS.

BY THE EDITOR.

Solubility of some Organic Acids.—É. Bourgoïn has determined that 100 parts by weight of pure ether, absolute alcohol and 90 per cent. alcohol dissolve at 15°C. (59°F). the quantities of acids given in the following table :

	Pure Ether.	Absolute Alcohol.	90 per cent. Alcohol.
Acid, benzoic	31.35	46.68	41.62
citric	2.26	75.90	52.85
gallic	2.56	38.79	23.31
oxalic	1.266	23.73	14.70
phtalic	0.684	10.08	11.70
salicylic	50.47	49.63	42.09
succinic	1.265	7.51	12.59
tartaric	0.400	25.604	41.135

Journ. de Phar. et de Chim., March, 1878, 173-179.

A new oxide of lead has been obtained by H. Debray. The oxides hitherto known are litharge, PbO , binoxide of lead or plumbic anhydrid, PbO_2 , and red lead or plumbate of lead, $\text{Pb}_3\text{O}_4 = (\text{PbO})_2\text{PbO}_2$. The latter compound is formed by heating either of the two former oxides to about 440°C (824°F). Debray has observed that when binoxide of lead is heated to 350°C . (662°F)., a rapid disengagement of oxygen takes place, which soon becomes less active, and when it has nearly ceased, the binoxide has been converted into sesquioxide or rather into the neutral plumbate of lead, PbO.PbO_2 . The same compound is formed by heating litharge to the degree indicated, and passing a current of oxygen over it; it is a greenish-brown powder which is very slowly oxidized to red lead in an atmosphere of oxygen and on continuing the heat.—*Ibid.* April, p. 549-253.

Separation of arsenic from other metals.—Ph. de Clermont and Frommel have made the observation that the freshly-precipitated sulphides of many metals when boiled with water are decomposed with the formation of sulphuretted hydrogen and oxide of the metal. Arsenic being the only one whose oxide is soluble in water, the authors propose its separation by washing the sulphides, obtained from acidulated solutions, until every trace of hydrochloric acid has been removed, after which the filter with its contents is boiled, preferably in a retort, the tension therein seeming to favor the dissociation; the precipitate from .2 gram of arsenic will be completely decomposed, when 500 or 600 cubic centimeters of water have been distilled. The contents of the retort are then filtered and the arsenic determined in the usual manner.—*L'Union Phar.*, April, p. 104.

Curare.—Dr. Jobert, in a letter dated Belin de Para, gives the following information concerning the preparation of this poison by the Indians. The principal ingredients are *urariuva* (probably *Strychnos castelnae*, Wed.)

and *eko* also called *pani du maharâo* (probably *Cocculus toxiferus*, Wed.) The young bark of these plants is well scraped, and the scrapings mixed in the proportion of 4 parts of the powder and 1 part of the latter; the mixture is well kneaded with the hands and in a funnel made of a palm leaf exhausted with cold water, the liquid being returned 7 or 8 times. The red infusion is boiled with fragments of *taja* (an aroidea) and *mucura-ea-ha* or *eone* (probably *Didelphys cancrivora*). After about 6 hours the liquid has acquired a thick consistence and is mixed with the scrapings of three species of pepper (*Artanthe*?) and *tau-ma-gere* and again boiled and allowed to cool, when it will have the consistence of a thick paste.—*Jour. de Phar. et de Chim.*, June, p. 443.

Catechin.—A. Gautier has communicated to the Académie des sciences his researches on catechin from catechu. He found its formula to be $C_{21}H_{18}O_8$, which differs from the formulas as ascertained by Zwenger, Hlasiwetz and Rochleder. Fused with potassa, protocatchate of potassium, $KC_7H_5O_4$, and phloroglucin, $C_6H_6O_3$, are the principal decomposition products obtained, besides a hydrocarbon, CH_{11} , water, formiate and carbonate of potassium, according to the supply of oxygen. Heated with very diluted sulphuric acid to $140^\circ C.$, an amorphous orange-colored body, $C_{25}H_{22}O_7$, is obtained, which is little soluble in hot water, precipitates ferric salts blackish green and is readily oxidized to red and brown compounds. Among the products of decomposition are also two which are soluble in ether, one of which is precipitated by acetate of lead and is protocatechuic acid; the other seems to have the composition $C_{14}H_{16}O_7$ and to be a polyatomic phenol.—*Jour. de Phar. et de Chim.*, May, p. 368.

Jaborandi.—Prof. Baillon has examined the jaborandi used by the pharmacists of Paris and noticed that three kinds are employed, namely, *Piper* (*Serronia*) *jaborandi*, Velloso, *Pilocarpus pennatifolius*, Lém., and *Piloc. Selloanus*, Engl. The first is now very rare in commerce. In regard to the others he suggests that they may, perhaps, be merely two varieties of one species. The author has in his possession fresh leaves of *Pil. pennatifolius*, the nerves of which are destitute of hairs on both sides; he has noticed, however, a slight difference in the color of the bark, which, near the top of the branches of *Pil. Selloanus*, is usually more yellowish or of a pale brown.—*Ibid.*, p. 393.

(For a description of these species see "*Amer. Jour. Phar.*," 1875, p. 177 and 214.)

The Lactic Fermentation of Milk Sugar. By Richet.—Milk kept at 40°C. coagulates and acquires an acidity equal to 1.6 gram of lactic acid for 100 of milk. The fermentation is completely arrested if sufficient hydrochloric or sulphuric acid is added to the milk, so that the acidity will correspond with 1 per cent. of lactic acid. But if gastric juice is added to the milk the casein will be coagulated and redissolved, and the lactic fermentation will proceed with an extraordinary rapidity, so that at the end of four or five days as much as 4 per cent. of lactic acid may have been produced. The rational explanation of this difference seems to be that the dissolved casein serves as a nutrition to the ferment; for if the milk is filtered immediately after its coagulation by rennet, the whey which contains all the lactose, but no casein, will acquire an acidity, never surpassing 1.6 per cent. of lactic acid. On the other hand, casein, deprived of milk sugar, will ferment and yield lactic and butyric acids among the products of decomposition. These observations explain why unfiltered milk ferments better than filtered milk; the author obtained, in one case, from the former, 3.9 per cent., but after filtration only 1.6 per cent. of acid.—*Jour. de Phar. et de Chim.*, May, p. 371.

Sulphovinate of Quinia.—P. Carles has ascertained that an acid and a neutral sulphovinate of quinia may be obtained, the former of which is very hygroscopic and, on account of its strong acid reaction, is not adapted for subcutaneous injections. The neutral salt is obtained by dissolving 16.6 grams of pure sulphovinate of sodium in 200 grams of 90 per cent. alcohol, and 42.8 grams officinal sulphate of quinia in 600 grams of the same alcohol, mixing the solutions, filtering from the precipitated sodium sulphate, and evaporating. The salt is perfectly neutral, crystallizes with difficulty in radiating prisms, is inodorous, of a very bitter taste, dissolves in 3 parts of water at 15°C. and in less alcohol. It is likewise very soluble in acetic ether and glycerin, but insoluble in absolute ether, benzol, oil of turpentine and fixed oils; with the latter, however, a kind of an emulsion may be formed on the addition of a few drops of alcohol.—*Ibid.*, June, p. 463, from *Bull. Soc. Phar.*, Bordeaux, March, 1878.

Pancreatin.—According to Th. Defresne, good pancreatin should have the following characters:

It is a tawny-colored, rather hygrometric powder, has a strong animal odor and taste, and dissolves in water to the extent of 70 per cent. of its weight; the limpid solution coagulates like albumen. It digests not less than 30 parts of albumen, transforms 8 parts of starch into sugar and completely decomposes 10 parts of lard. The digestion of albumen takes place in the presence of a little acid, one drop of lactic acid being sufficient for 15 grams of albumen and 25 grams of water; no other addition is required for starch or lard; the temperature may vary between 20° and 40°C. (68° and 104°F.)

The author has examined some samples of German pancreatin, which were of a whitish color, resembling powdered orris root, of a sweetish odor and a cheese-like taste; they contained about 80 per cent. of milk sugar and 15 per cent. of insoluble matter, and digested between 0 and 6 parts of albumen. A sample of French pancreatin was in greyish pieces, of a strong animal odor and taste, completely soluble in water, but the solution was not coagulated by heat and did not digest albumen.—*Rép. de Phar.*, April, p. 153.

Purification of Carbonic Acid Gas.—Méhu states that the disagreeable odor and taste of carbonic acid gas generated from dolomite were completely removed by passing the gas successively through water, persulphate of iron, permanganate of potassium, and again through water, when it was unobjectionable for the preparation of mineral waters.—*Jour. de Phar. et de Chim.*, April, p. 290.

A Hydrate of Ether.—On filtering an ethereal liquid with free access of air, a frost-like congelation is observed on the upper part of the filter, its appearance and quantity depending upon the temperature and the hygrometric state of the atmosphere. Tanret has collected some of that solid substance, and found that after it had been completely freed from ether by strongly blowing upon it, it had the temperature—3.5°C. (25.7°F.), and on fusion yielded 17 to 18 parts of water for 37 of ether; the formula $(C_2H_5)_2O \cdot 2H_2O$ requires 18 parts.—*Ibid.*, May, p. 345-347.

Color Reactions of Oil of Valerian.—In an essay on the chemical constitution of oil of valerian (see page 339), communicated to the Académie royale de médecine de Belgique, G. Bruylants gives the following color reactions which may be observed with the freshly prepared or old oil, and with all ethereal and alcoholic tinctures of the root:

1. Gaseous hydrochloric acid gas imparts a splendid purplish-red color.
2. Perchloride of phosphorus gives a red color, turning to blue and finally to green when a moderate heat is applied.
3. Heated with a little nitric acid, a purplish-red color is produced, which changes to violet and blue.—*Ibid.*, June, p. 439.

Wine of Creasote.—Dr. Fournier gives the following formula : 6 grams of beechwood tar creasote are dissolved in 125 grams of alcohol ; to the solution is added simple syrup 400 grams, and enough Malaga wine to make one liter. Each tablespoonful contains .30 gram of creasote, and the dose is readily taken in a glass of sweetened water.—*Jour. de Phar. et de Chim.*, May, p. 377.

The formula of Bouchard and Gimpert is as follows: Creasote 13.5 grams, alcohol 250 grams, tincture of gentian 30 grams and Malaga wine sufficient for 1 liter.—*L'Union Phar.*, May, p. 132.

Caustic of Chloride of Zinc.—Under the name of *Pâte de Canquoin* a preparation is used in France which, according to the Codex, is prepared by dissolving chloride of zinc in a small quantity of water and adding, with continual trituration, an equal weight of flour. P. Carles has found this to be too hygroscopic, and proposes to triturate in a mortar 10 grams of fused chloride of zinc with 2 grams of 60 per cent. alcohol, and incorporating, with constant trituration, 15 grams of wheat flour. This mass may be formed into cylinders of suitable size, and when once dry is but little affected by atmospheric humidity. The author has kept samples in stopped vials for over three years without noticing any alteration.—*L'Union Phar.*, April, p. 100.

THE FAST-GROWING VARIETY OF CINCHONA CALLED PUBESCENS.

BY J. E. HOWARD, F.R.S.

I send a few facts to complete (thus far) the history of the above promising sort, to which Dr. de Vrij has very properly called attention in your columns (April 13) ; and respecting which I had much correspondence with the late Mr. McIvor.

It is about ten years since this skillful cultivator raised from seed two sorts of *officinalis*, which for some reason he considered to be hybrid with *C. succirubra*. The two were alike distinguished by strong and

vigorous habits of growth, and at a little distance it was difficult to discriminate between them. As they developed, however, it was found that the one with slightly pubescent leaves yielded much more quinia in the bark than the other. I suggested, for distinction's sake, calling this the *var. pubescens*, which has unfortunately since become changed into *C. pubescens*, How., an entirely erroneous designation.

Referring to the bark sent both to Dr. de Vrij and to myself in 1873, Mr. McIvor says, "This bark is taken from a hairy-leaved variety of *C. officinalis*. It is a tree of wonderful growth. It produces enormously thick bark, and the tree is not injured by wind. The tree from which I now send you the bark is only five years old. It is twenty-six feet high, and has a stem of sixteen inches in circumference at the ground, and the bark now sent you is taken in a strip from the stem to the height of about twelve feet from the ground. This tree grows at least twice as fast as *C. succirubra*. The bark of this variety which I sent to Dr. de Vrij was taken from a tree grown at a high elevation and with a N. W. exposure. The bark now sent you is taken from a tree growing at a low elevation with a N. E. exposure. Dr. de Vrij found the bark of this species to yield 10.67 per cent. of total alkaloids, with 4.72 of crystallized sulphate of quinia. If under all conditions this bark is found to yield this amount of alkaloids, and especially quinia, it is certainly the best plant we can grow; being hardy and of rapid growth and perfectly free from canker and other diseases to which the *officinalis* and especially the *calisaya* are liable. I therefore sincerely hope that you will be able to confirm Dr. de Vrij's results, and if this occurs in the two barks taken from different positions of elevation, it will establish the value of the species beyond doubt."

The examination which I made quite confirmed and even surpassed the results obtained by Dr. de Vrij, as the notes I have preserved indicate a produce equal to 6.00 sulphate of quinia, 5.00 sulphate of cinchonidia, cinchonina and amorphous alkaloid 1.20 per cent. Even this was exceeded after an additional year's growth. In June, 1874, Mr. M. writes, "I take the liberty of again sending you some bark of *C. pubescens*. This sample is of the narrow strips left on the same tree from which I took the bark sent to you in December last. If not giving you too much trouble, I would very much like to know what this bark yields, the more so [as some persons] have been trying to

impress on the government here that mossing does not improve the bark on the tree generally, and that the renewing bark draws the alkaloids from the natural bark adjoining, *i. e.*, that the alkaloids in the natural bark are transferred to the renewing bark. I do not believe this to be the case, but if it is so in any degree the bark now sent you will show exactly to what extent this takes place; as the narrow strips of bark were surrounded on all side by renewing bark."

The examination of the above "strips" was therefore of special interest in connection with an important problem in vegetable physiology. They gave equal to—

	Per cent.
Sulphate of quinia,	6.94
cinchonidia,	4.48
cinchonia,	0.20
quinidia,	0.14
Amorphous alkaloid,	1.14
	<hr/> 12.90

Thus disproving the transference theory.

It will be noticed that my friend de Vrij has recently obtained more quinia and less cinchonidia than I have done. This is no doubt owing to his having described the results of examination of renewed bark. I have also a small specimen of this, but have not subjected it to examination.

It is obvious that a plantation of this kind is likely to be very profitable. Mr. McIvor wrote me in August, 1875, that 20 acres had been planted in the previous year, and that in the year above named they had planted out 60 acres on the Kartairy estate. The next year occurred his lamented decease, and I am unable to continue my record in consequence.

The great question is, how far is it possible to count upon the propagation of this sort. Mr. McIvor speaks with a varied amount of certainty. In the last letter I had from him he says, "You are quite correct as to the danger of relying on plants raised from seeds of our hybrids; of course to be certain we must propagate from cuttings only, but *pubescens* comes pretty true. Still I would not rely on a plantation formed by seedlings even of this variety."

In 1874 Mr. M. sent me a few seeds, from which I have one plant¹ remaining, which reproduces all the character of vigorous growth and

¹ Another has diverged.

promising aspect of the parent plant. It is already between six and seven feet in length, and the leaves reach the length of 9 or 10 inches by 6 inches in width. The plant may be a hybrid; but if so, as admitted by Mr. McIvor, it has much more the characteristics of *C. officinalis* than of *C. succirubra*. I send for the Musum of the Pharmaceutical Society a section of a tree of this sort sent me by Mr. M., from which those who are conversant with the characteristics of the wood of these different species will easily discern what I have stated to be true. A good botanical specimen in a collection given me by McIvor does not appear to settle the question of hybridity.

It remains that I add a parting word about *Cinchona pubescens*. This very distinct species was named by Vahl, and has been described and figured by Dr. Weddel. Not much is known about the ♂ form, but in its form *Pelletierana* it is the source of the bark from whence aricina was procured, and from whence I have myself many times obtained this much contested alkaloid. Its whole chemical constitution is distinct from other cinchonæ, the cinchona red being superseded by an intensely yellow substance. It is no longer to be met with in commerce, as it is useless except for scientific investigation, and has certainly never been introduced into India. So I hope we have heard the last of *C. pubescens*, Howard, though not of the promising sort of *officinalis* which obtained this erroneous name.—*Phar. Jour. and Trans.* [Lond.], April 25, 1878.

QUINIRETIN.

BY PROFESSOR FLÜCKIGER.

Forty years ago Geiger was well aware of the fact that aqueous solutions of salts of quinia are decomposed in sunlight. It would appear that Pasteur¹ attributed this alteration to the formation of quinicia and cinchonicia, for in his researches on the two latter substances he remarks, "J'ai reconnu, en effet, qu'en exposant au soleil, seulement durant quelques heures, un sel de quinine et de cinchonine quelconque, en solution étendue ou concentrée, il s'altère à tel point que la liqueur prend une coloration rouge-brun extrêmement foncée. Cette altération est d'ailleurs de la même nature que celle qui s'effectue sous l'influence d'une température élevée." He recommended the manufacturers

¹ "Comptes Rendus," xxxvii, 1853, p. 114.

of quinia not to expose to direct sunlight either their products or even the barks.

Carles¹ exposed powdered Calisaya bark to sunshine during the month of August, and found it to yield afterwards less quinia than before. Broughton² likewise pointed out the detrimental influence of direct sunshine on barks collected in the government plantations in the Nilghiris.

Hesse,³ on the other hand, stated that the influence of light was by no means so powerful, and did not favor very vigorously the formation of amorphous alkaloids. He exposed for seventy-three days to sunlight an aqueous solution containing 3.72 per cent. of quinia in the form of sulphate. Quinia was found to be at last contained in the liquor, besides a red amorphous substance no longer possessing the property of neutralizing the acids. Hesse did not meet with the latter in the barks as might be expected, supposing sunlight to act in the same way on the alkaloids contained in the tissue itself.

Mr. David Howard⁴ ascertained that quinia at least occurs in the mother-liquors obtained in manufacturing quinia, and Dr. de Vrij⁵ is of the opinion that not only quinia and cinchonina, but another third amorphous alkaloid is present in the barks.

The influence of sunlight on the latter and on their bases is a very interesting question, as shown by the experiments just alluded to. They refer not to the alkaloids, but to salts of them. What part is played by the acids with which the alkaloids are combined? Are the alkaloids themselves likewise altered by sunshine or only their salts?

I thought it of some interest to submit quinia to a few experiments, and was struck to see how rapidly and thoroughly it is altered; 2,000 parts of water at 17°C. dissolve a little more than 1 part of quinia, yielding a clear solution, which remains colorless and clear for any length of time, provided it be kept in the dark or in dispersed daylight, in closed or in open phials. But on exposure to sunlight in July or August, for a few hours, the liquid turns yellowish or brownish, the coloration being developed uniformly in the whole solution, not begin-

¹ "Jour. de Pharm.," xii, 1870, p. 161.

² "Blue Book, East India Cinchona Plantation," 1870, fol. 241, 243, 118.

³ "Annalen der Chemie," clxvi, 1873, p. 275.

⁴ "Pharm. Journ.," i, 1871, p. 485, and ii, 1872, p. 765.

⁵ "Pharm. Journ.," iv, 1874, p. 589.

ning at the surface. By and by it becomes turbid, and after a few days a flocculent brown matter sinks down, amounting when dry to nearly the quantity of quinia originally employed. A very little of it remains in solution, for the latter remains brownish and has always a bitter taste, reminding of quinia. Yet in the clear solution the alkaloid is present in so trifling an amount that the brown liquid becomes but very faintly turbid on addition of either tannic acid or iodohydrargyrate of iodide of potassium. By both these tests, as well known, precipitates are produced in a solution containing even less than 1 part of quinia in 2,300 parts of water before it is submitted to the action of light.

The transformation of quinia into the brown flocculent substance, which for the sake of brevity may be termed quiniretin, is due to sunlight exclusively. If water is boiled in order to deprive it of air as much as possible, and then saturated with quinia, the cooled filtered solution keeps perfectly colorless until it is exposed to sunlight, when it soon begins to turn yellowish. It is true, however, that in a closed tube, in the dark, the aqueous solution, if quinia, turns red, yet not brown, as soon as it is heated to 170°C.; at 300° it affords an intensely red liquid. The effect of sunlight is the same if the solution of quinia is deprived of air by a current of hydrogen and the tube immediately closed; the solution thus absolutely deprived of oxygen becomes brown in sunlight.

The brown substance, which I call quiniretin, must therefore continue to have the same composition as quinia, but it is modified in an extremely remarkable way; it is neither quinia or quinicia, nor does it contain a trace of either. Quiniretin is devoid of an alkaline reaction, insoluble in both alcohol and ether as well as in hot or cold water, softening but a little in boiling water. It is not fusible, but melts only far above the melting point of quinia, yet quiniretin then undergoes a thorough decomposition.

Quiniretin is dissolved by acids, but unable to neutralize them or to combine with them. It is abundantly soluble in hydrochloric acid 1.11 sp. gr.; this solution displays an intensely brown color, and may be diluted with water without becoming turbid. Its very bitter taste reminds of that of quinia, but it is at the same time somewhat, I may say, aromatic. The hydrochloric solution of quiniretin is not precipitated by tannic acid; this is likewise in favor of the statement that it is not an alkaloid. The solution is precipitated, on the other hand, as

soon as it is neutralized by ammonia, yet quiniretin is not dissolved by an excess of the latter, and in this respect, too, it differs from quinicia.

It must be granted that the iodohydrargyrate of potassium (1.35 per cent. chloride of mercury, 5 iodide of potassium, 100 water) yields an abundant precipitate in the hydrochloric solution of quiniretin, but the same may be said with regard to other salts, for instance chloride of ammonium or sodium.

A small quantity of dilute sulphuric acid (1.112 sp. gr.) gently warmed and shaken for a day or two with a large excess of quiniretin, affords always an acid liquid of a yellowish hue, far less colored than the hydrochloric solution. The former is not fluorescent, and is decolorized by chlorine water. On addition of ammonia the latter assumes a dingy green hue or yields a greenish precipitate; these reactions succeed better if quiniretin is immediately dissolved in chlorine water (it will usually contain an appropriate amount of hydrochloric acid) and ammonia added to it. This behavior agrees with that of quinia, quinicia and quinidia (conquinia), yet quiniretin again differs from these three alkaloids, inasmuch as it does not afford that red tar (Grahe's test) which makes its appearance if barks containing quinia or the allied alkaloids, or certain salts of them, are heated in a glass tube.

Quiniretin, consequently, differs very widely in many respects from quinia, its mother substance, the composition of which quiniretin must necessarily share with regard to the conditions of its formation, as pointed out above. I may add that I have restricted myself to ascertaining the presence of nitrogen as a constituent of quiniretin. The intense action of sunlight, especially in summer, causes the quinia to be transformed. The alteration is not precisely more favored by acids; the aqueous and also the alcoholic solution of pure quinia is more rapidly transformed; dry quinia requires more time. The other alkaloids of cinchona are much less affected by sunlight than quinia, at least in aqueous solution. This, no doubt, depends upon their sparing solubility, quinia being more readily dissolved by water. It is interesting to see how little kinic acid is altered by sunlight; saturated or diluted aqueous solution of it was but almost imperceptibly affected after a summer's stay in sunshine. As to quinovin, I noticed the absolute absence of any coloration after a similar treatment.

Aqueous solution of morphia is very slightly colored by sunlight,

solution of codeia very much ; solution of strychnia is scarcely altered, that of brucia turns brown. It is evident that the amount of solubility is of prominent importance in these experiments, codeia as well as brucia being much more abundantly soluble than morphia or strychnia. Further experiments relating to these remarkable effects of sunshine should be simultaneously instituted by means of other solvents than water.

I thought my few observations worthy of notice, inasmuch as they refer to quinia itself, other chemists having examined its salts. It would appear that the absence of acids prevents the formation of quinicia.—*Pharm. Journ. and Trans.*, May 11th.

THE MINERAL SPRINGS OF TURKEY.

BY X. LANDERER.

These springs may be arranged, according to their chief constituents, as follows : *Sulphur* springs (theiothermæ), *Chalybeate* springs, *Alkaline* springs, *Carbonic Acid* springs.

SULPHUR SPRINGS.—*Tchesme* (now Kallede).—The peninsula was called by the ancients Myonesus, from the large number of mice found there. In the neighborhood are found the ruins of Erythrea. The springs were known to the ancients (see Pausanias) and seem to have been in great repute, to judge from the magnificent remains of buildings in the immediate environs.

The temperature of the water averages 145°F. (50°R.), and some of the springs reach 158°F. (60°R.) They are very efficacious in skin diseases, rheumatic affections and scrofulous diseases.

Nissyros (formerly Porphyris).—It is a small island only a few miles in diameter, and with about 3,000 inhabitants. In the centre of the island is found a large cavity containing a large quantity of sulphur, and here is found the spring called by the inhabitants bromoneri (stinking water). From most of the fissures escape vapors of sulphuretted hydrogen of quite a high temperature. In one place a house is built over such a fissure for the use of persons who wish to take a sulphuretted steam bath ; this is called Pyria.

Adramiti.—Although strongly sulphuretted, no facilities exist, and the patients are obliged to dig holes in the neighborhood, conduct the water there, and bathe in this way. These waters are said to be very efficacious taken internally in consumption and in asthma.

Lemnos has from old times been considered as the abode of Vulcan, and is now nearly uninhabited, owing to repeated eruptions of lava. There exist two springs, one chalybeate and the other sulphuretted.

Smokobo has been renowned from the earliest times. There exist two basins, one of which is reserved for the use of animals.

Salonica.—These springs are the most renowned in Macedonia, and the town was by the ancients therefore called *Thermæ*, and the Bay of *Salonica*, *Sinus thermaicus*. The water is considered very efficacious, not only in rheumatic affections and skin diseases, but also in metallic poisonings and syphilis. The mud might be used with advantage.

Nicomedia.—The town of *Isnimid* is situated not far from the Bay of *Nicomedia* (formerly *Sinus astacenus*) and some twenty miles northwest of *Broussa*. The springs, called *Yalova*, are next to those of *Broussa*, most in repute with the inhabitants of *Constantinople*.

Kioussesi.—The mud deposited in these springs, and called *theiothermine*, is used as poultices in ulcers and other skin diseases.

Erzerum.—About 12 hours' travel from *Erzerum*, near the village of *Hassan-Kale*, are found the springs, which are surrounded with splendid buildings.

Springs of Syria and Mesopotamia.—In that part of *Syria* which comprises the *Libanon* and *Antilibanon* several springs are found of different composition, and near *Aleppo* are found sulphur waters.

In *Antiochia* (now *Antakia*) are found magnificent ruins of colossal aqueducts, which conducted the water of mineral springs found in the vicinity.

CHALYBEATE SPRINGS.—*Troy* (now *Eski Stambul*).—This water has a ferruginous, very saltish, taste, and is much used in chlorosis and chronic hemorrhages. The springs are called *Lidjia hamam*.

Icaria.—Three springs are found on this island, which anciently was called *Dolicho*, and, from the great number of fishes found there, also *Ichthyoessa*. One of these springs has a temperature of 127°F. (42°R.), and is found near the village *Agios Kyrillos*; the other near the cloister *Panayia Evangyelistra*. The third spring is sulphuretted.

Angora.—In *Galathea* of old (now *Angora*) two kinds of mineral springs are found. The ones are cold and ferruginous, the others hot and sulphuretted. The chief chalybeate springs are found at *Kidje hamam* and *Schah hamam* and have got a wide reputation in dropsical cases.

Chos.—This island, the birthplace of *Hippocrates*, formerly called *Merope*, now *Stanchio*, possesses four springs. One called *Kokkino neron* (red water) or *Xono neron* (acidulated water) is found near *Burina*, and is said to be very good in enlargement of the spleen. Not far from this one are found some sulphur springs, which are intermittent. Near *Saint Marim* is found a saline spring, which is said to be the original Hippocratic spring.

Pergamos.—This town, the birth-place of *Galenus* and *Oribasus*, is situated near several small springs, which, however, are not much visited, since the tanners use the waters for softening the hides.

ALKALINE SPRINGS.—*Saint Catherine in Macedonia.*—Between *Salonica* and *Volo*, near the base of the *Olympus*, are found several springs of bitter water, with a temperature of 118°F. (38°R.) The water is very useful in disorders of the liver, spleen and intestines.

Candia.—Near the village of *Rethimo* is found the only important spring, which

may be classed as a weak soda water. It is used in gravel, stone in the bladder and other maladies of the uro-poetic system.

Bathy belongs to the class of bitter waters, and is used by the inhabitants as a spring medicine. *Bathy* is situated on the Bay of Adramite, not far from Kidonia.

Boli.—Near the base of Ala Dag, in Bithynia, is found one of the most remarkable caves, with beautiful stalactites. Not far from this cave, near the ruins of ancient Acherusia, are found several springs of great repute in the neighborhood. Some sulphur springs are found near Gerede (Ptolomy's Cratia).

Enos.—In the vicinity are found several small springs, the water of which has a very bitter, saltish taste, and a considerable amount of carbonic acid gas. It is very useful in maladies of the liver and spleen, sequences of the malarial fevers which are so frequent throughout the Orient. In the environs are found ruins of a palace of the emperor Trajan.

Kainurio.—Not far from Pharsalus (Macedonia) exists a spring of bitter water, which is considered efficacious in scrofula. A second spring (saline) is found in the vicinity of Kephalo. A third is found near Milies, and called by the inhabitants *kala nera* (good water). All these springs contain chloride of sodium and sulphate of magnesium.

Lebedos or *Lidjia*.—About six or seven hours' travel from Smyrna are found the ruins of Lebedos (Lebethos of Pliny and Strabo), now called Elidja. Here are found some springs of bitter water, with a temperature of 95°F. (28°R.)

Tenedos (formerly Leucophrys) has a spring, the temperature of which is 86°F. (24°R.) The water is used chiefly as spring medicine.

Astyra or *Kirk Gheuz* (that is forty eyes), the water issuing from about forty apertures. The temperature varies, from time to time, from 100°F. (30°R.) to 167°F. (60°R.)

Arimathea.—Near Jerusalem, in the place called Atzeldamah (Blood acre), purchased with the thirty silver pieces which Judas Iscariot threw away, is a spring of a very saltish and bitter taste which is renowned over all Palestine for its vermifuge properties.

CARBONIC ACID SPRINGS.—*Iesba* (in Bulgaria) possesses a spring of very cold water containing an abundance of carbonic acid gas. Waters like this are very rare in the Orient and not surpassed by any in the rest of Europe. It is reputed efficacious in pulmonary consumption and other affections of the chest.

Ephesus.—Near the ancient town of Ephesus is situated the village Aya Suluk, which possesses a spring called formerly Alethaia.—From *Gazette Médicale d'Orient*, September, 1877.

H. M. W.

VARIETIES.

Tayuya as a Remedy for Syphilis.—*Tayuya*, a plant from Brazil,¹ has been highly recommended during the past few years as a remedy for syphilis and scrofula. It has been used chiefly by the Italian surgeons. All parts of the plant are used,

¹ Said to be *Bryonia Tayuya*, *nat. ord. Cucurbitaceæ*.—EDITOR

but the most efficacious in syphilis is the root, either as a watery infusion or a tincture made by adding 1,000 grams of 80 per cent. alcohol to 339 grams of the powdered root. The strong tincture thus obtained is to be diluted by the addition to it of 1,000 grams of rectified spirits. Of this, 14 drops is the maximum dose for an adult.

Ambrosoli, who has used it freely in the Maggiore and Sifilocomio hospitals of Milan, reports favorably on its use in syphilis, and states that the skin affections, ulcerations and swellings of the glands are promptly relieved by it. Veladini reports "brilliant results," as do also Magri, Strambio, Bazzoni and others. Gamba, however, in the Syphilitic Hospital for Women in Turin, has not had such satisfactory results. Ziessl, of Vienna, states that he has seen no injurious results from tanyua, and, after giving it a fair trial, he greatly prefers it to mercury in the early stages of syphilis. He is not yet prepared to express a positive opinion as to its value in the later stages of the disease.—*Virginia Medical Monthly*, April, from *Allg. Wien. Med. Zeitung*, No. 3, 1878.

Antidote to Phosphorus.—Hager recommends old oil of turpentine for this purpose, and states that the rectified oil is entirely unreliable as such.—*Phar. Centralh.*, March 28, 1878, p. 120.

Pitcherine—A New Stimulant.—The *British Medical Journal* has a long account of a new stimulant, which has been lately described by the papers of Australia. It is called by the natives pitcherine, and is used as we use tobacco, for both smoking and chewing. The effect is that of pleasant exhilaration; when long continued, intense and continuous excitement follows. It is used, when on long foot-journeys, to invigorate and keep up the strength or excite them to courage in battle; large doses are said to infuriate all the passions. Some of the natives make a plaster of this plant and place it back of the ears, believing they are influenced by it.—*Virg. Med. Monthly*, April.

Plastilina is a permanently plastic mass, which has been recently introduced for the use of artists. F. Giesel has analyzed it, and gives the following formula for its preparation: 300 grams oleic acid and 43 of zinc oxide are heated together until combined; this zinc salt is fused together with 60 grams of wax and 130 of olive oil, and the fused mass intimately mixed with 250 grams of sulphur and 118 grams of clay, both in the form of impalpable powder.—*Ber. Deutsch. Chem. Ges.*, 1878, p. 310.

Plating Iron with Platinum. By I. H. Johnson.—The iron is first coated with lead and copper, by applying with a fine brush a paste made by mixing 22 parts of borate of lead and $4\frac{1}{2}$ parts of oxide of copper with a little oil of turpentine. The iron is then heated and immersed in the solution of platinum; after which it is allowed to dry, and then baked at a moderate temperature. The solution of pla-

tinum used is made as follows: 10 lbs. of platinum are transformed into chloride of platinum, which is mixed with 5 lbs. of ether; the latter is then allowed to evaporate spontaneously. A paste is then made of the residue with a mixture of 20 lbs. of borate of lead, 11 lbs. of red lead and a little oil of lavender; then 50 lbs. of amylic alcohol are added.—*Pharm. Centralh.*, March 28, 1878, p. 118.

For Falling Out of Hair.—Erasmus Wilson recommends a lotion composed as follows:

℞ Liq. Ammon. fort,
 Ol. Amygd,
 Chloroformi, aa 5i
 Spts. Vini *vel*, spts. rosemar, 5v
 Ol. Limonos q. s. to flavor.

Mix. This should be rubbed on the scalp after thorough friction with the hair brush. There are cases in which it should be used with caution, or largely diluted.—*Ohio Med. Recorder*, April.

Tully's Powder.—

℞ Morphine sulph., gr. .
 Camphoræ,
 Crete preparatæ,
 Sacch. alb., aa gr. xx. M.

Used sometimes as a substitute for Dover's Powder.—*Ibid.*

Bichromate of Potash in Syphilis.—In the "*Annales de Ciencias Medicas*," for April, Dr. Carlos Vincente Charpantier gives a series of cases illustrating the value of bichromate of potash in secondary and tertiary lesions. Though not altogether new, this treatment is not much known, and yet, from these observations, well deserves to be. The dose is one-fourth of a grain, doubled every three or four days to two or three grains. During the treatment all alkaline substances are prohibited, as liable to neutralize the chromic acid, which is the active agent. From some experiments on himself, Dr. C. finds the bichromate to lower both pulse and temperature in a marked degree.—*Med. and Surg. Rep.*, June 1.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The twenty-sixth annual meeting of the American Pharmaceutical Association will be held in the city of Atlanta, Georgia, on the first Tuesday, the third day of September, 1878, commencing at three o'clock, P. M.

Mr. J. W. Rankin, of Atlanta, the Local Secretary, will be glad to receive articles for exhibition and make arrangements for their display. There will doubtless be a large gathering of Southern pharmacists on this occasion and from among them a considerable accession to our ranks; many new members are also expected to join us from the more Northern States.

The twenty-sixth meeting is likely to be one of more than ordinary interest. In addition to the usual reports it is expected that the Committee on the Revision of the Pharmacopœia will have a very important and interesting one to present; much valuable information may also be expected in the replies to queries, and in the volunteer papers. The city of Atlanta has many attractions and is beautifully and healthfully situated amidst charming scenery. Our Southern friends are expecting a large attendance, and will be glad to welcome to their beautiful city all who can come. Let there be a grand rally of Northern pharmacists.

WM. SAUNDERS, *President*.

London, Ontario, Canada, June 17th, 1878.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 24th, 1878.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the College hall. Charles Bullock, Vice President, in the chair. Fifteen members in attendance.

The minutes of the Annual Meeting in March last were read, and on motion approved.

The minutes of the Board of Trustees during April, May and June were also read, and on motion adopted. The minutes of the Board for December, 1877, show the election to honorary membership of Messrs. Joseph Bosisto of Victoria, Australia, and Professor Alfonso Herrera of Mexico; and as corresponding members Messrs. L. Crêteur and Achille Jonas, both of Brussels, Belgium.

A report of the committee, appointed at the annual meeting to consider the propriety of changing the mode of electing the Board of Trustees, was read by Mr. Wiegand. It was on motion adopted, but considerable discussion arising upon another subject pertinent to the duties of the committee, the report was referred to them for further consideration.

The following gentlemen were elected delegates to represent this College at the Annual Meeting of the American Pharmaceutical Association, which will convene at Atlanta, Georgia, on Tuesday, September 3d, 1878, viz.: Alonzo Robbins, Prof. J. P. Remington, Charles Bullock, J. L. Patterson and Dr. F. M. Murray.

An election for delegates to represent the College in the Convention of Teaching Pharmaceutical Colleges, which will meet at the same time and place, resulted in the choice of the following gentlemen, viz.: Prof. John M. Maisch, Prof. J. P. Remington and Charles Bullock.

Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—The time is drawing near for the twenty-sixth annual meeting, which, as our readers know, will be the first one held in the State of Georgia, and will doubtless be attended by many pharmacists and druggists from the Southern States. A considerable attendance is likewise expected from the more Northern States, since aside from the attractions of the meeting, the locality selected will induce many to embrace the opportunity for paying a visit to one of the fairest portions of the South, which is reached by passing through a section of country full of interest and scenic beauty. It is contemplated to organize an excursion party, and we may now state that the route will be at a considerable distance from those districts which may be considered as being under malarial influence throughout a portion of the warm season. The details will be communicated to the members in due season; in the meantime the secretary would invite those who contemplate to be present to inform him of their intentions.

In order to make the necessary preparations for the exhibition of pharmaceutical novelties and objects of interest to pharmacists, it is very desirable that the local secretary, Mr. J. W. Rankin, be informed without delay of the space desired.

We are pleased to give publicity to the following report of the Committee on Prize Essays, awarding the Ebert prize to Mr. Fr. B. Power, for his valuable investigation on resin of podophyllum:

To the President of the American Pharmaceutical Association:

The Committee on Prize Essays would respectfully report, that having carefully examined all the original essays presented at the Twenty-fifth Annual Meeting of the American Pharmaceutical Association, they have unanimously, and independently of each other, decided to award the "Ebert Prize," for the year 1877, to Mr. Frederick B. Power, for his essay, "On the Resin of the Rhizome of *Podophyllum peltatum*, Linn."

The considerations that prompted the committee to make the award to Mr. Power were

1. The evidently scrupulous care in the identification of the drug and in the execution of the experiments which the author conceived to be necessary, thereby insuring a series of results that will stand conclusive for the sample of *podophyllum* rhizome experimented with.

2. The results, which are confirmatory in some directions and contradictory in others, contribute materially to our knowledge of the constituents of the *podophyllum* rhizome, and, if not conclusive, are calculated to incite renewed investigation, particularly as regards the hitherto undisputed presence of *berberia* in the drug.

The committee do not consider it expedient to subject the essay to a nearer criticism. The results obtained by Mr. Power may be disputed or confirmed by future experimenters; but they have, beyond a doubt, rendered the existence of *berberia* as a constituent of the rhizome of *Podophyllum peltatum* questionable, and clearly prove its absence in the particular sample examined by Mr. Power.

A strict interpretation of the "by-law" governing the action of this committee prevents direct reference to other meritorious essays that were selected by the committee for special consideration.

C. LEWIS DIEHL,
J. F. JUDGE,
E. SCHEFFER.

Cincinnati, June 19th, 1878.

Association of the Alumni Massachusetts College of Pharmacy.—At the meeting, June 6th, the Syrups of the Pharmacopœia were the subjects of discussion, several members, at the request of Mr. S. A. D. Sheppard, having experimented and presented the results of their observations. Mr. Sheppard detailed an interesting account of his experience with *Syrup*, and gave his opinion that cold percolation or agitation were to be preferred to heat, and that fifteen (15) parts by weight of sugar to 8 parts by weight of water gave a syrup leaving nothing to be desired.

Mr. Thomas Doliber approved the plan of cold agitation, stating that it had been the custom of the firm which he represented to prepare 30 gallons at a time by this process. He advised a final filtration through paper as an improvement over ordinary straining. Mr. Sheppard read extracts from a letter written to the Pharmacopœia Committee of the American Pharmaceutical Association, by Mr. Edwin Baker, Esq, Shelbourne Falls, Mass., suggesting a process combining agitation, maceration and percolation, for which the writer claimed good results. President Flanagan exhibited aromatic and simple syrups of rhubarb prepared with water as a menstruum.

Mr. Lowd showed samples of Syrup of Iodide of Iron, and read a formula said to be satisfactory.

Iodine,	.	.	.	.	10 parts (by weight)
Iron wire cut in pieces,	.	.	.	.	3 " "
Water,	.	.	.	.	4 " "

Mix in a flask and shake until the reaction of the Iodine and Iron is complete. Add to syrup boiling, 100 parts; shake, and when cold, add syrup to make 130 parts.

Mr. Sheppard presented a formula for syrup of ipecacuanha, by precipitating the resinous matter from the fluid extract by hot water. The precipitate was less in weight by hot water than by cold, and the syrup was much brighter in appearance. He also showed samples of syrup of ipecacuanha, made by precipitating the resin by a mixture of water, acetic acid and glycerin, and stated that his experiments on this syrup were not complete. If this syrup is to be made from the fluid extract, our chief attention should be turned to fluid extract to be made efficient and be miscible with simple syrup.

Mr. Goff exhibited compound syrup of sarsaparilla made in accordance to U. S. P. process, with the exception of pale rose, which he was unable to obtain in the Boston market. Mr. Doliber corroborated this statement, and Mr. Davidson suggested white rose as a substitute for the pale, it possessing a fine aroma and slight laxative tendency.

Mr. Edward S. Kelley read a formula for a permanent syrup of Phosphate of Iron, Quinia and Strychnia.

The Pennsylvania Pharmaceutical Association held an adjourned meeting in American Hall, at Reading, on June 11th. President Heinisch opened the session, giving a brief account of the organization and the aims of the association. Hon. Chas. F. Evans, Mayor of Reading, extended a hearty welcome to the members, which was responded to by the president. After roll-call and the reading and approval of the minutes, the Executive Committee reported the names of many applicants for membership, who were duly elected. A question arose as to the time for which the officers were elected at Harrisburg in February; a motion was made and carried requesting the officers to serve until the election of their successors at the next annual meeting.

The Secretary reported that steps had been taken to procure a charter, and that the necessary application would soon be made. The members residing at Harrisburg were empowered to make the application. The poison bill passed at the last

session of the Legislature was read and discussed, and reference was made to the bill attempting to regulate the practice of pharmacy (see pages 362 and 363). A very interesting paper on a drug press, constructed by Mr. Chas. T. George, of Harrisburg, was read, and samples of cold-pressed linseed oil, of excellent quality, obtained therewith, to the amount of 19 per cent, were shown. We expect to publish a full description of this press in our next number.

Mr. George exhibited also a specimen of citrate of iron and cinchonidia, prepared by him, and which is beginning to be used to some extent.

At the second session, held in the afternoon, it was decided that twelve members constitute a quorum of the association; and the Secretary was instructed to procure a blank book, to be used as a register, and to have a suitable number of the constitution, by-laws and roll of members printed. The following gentlemen were elected *honorary members* of the association: Dr. E. R. Squibb, Brooklyn, N. Y.; William Saunders, London, Ont.; Chas. A. Tufts, Dover, N. H., and Prof. Rob. Bridges, M.D., Philadelphia.

An election of five delegates to the meeting of the American Pharmaceutical Association, resulted as follows: Messrs. Lemberger of Lebanon, Kennedy of Pottsville, Stein of Reading, George of Harrisburg and Ross of Lebanon.

Mr. Burns of Minersville, from the Committee on the Next Annual Meeting, reported that it be held at the city of Pittsburg on the second Tuesday of June, 1879. The report was unanimously adopted.

A committee of three, consisting of Messrs. Remington, Maisch and Patterson, of Philadelphia, was appointed to obtain some designs for a certificate of membership, ascertain the cost and report at the next annual meeting; also a committee on papers and queries, consisting of Messrs. George, Kennedy and Heinitsh.

The subject of the State tax on the sale of patent medicines was brought up and discussed. It appears that the tax is not collected in some counties, and in others very unequitably levied, general dealers selling patent medicines being usually not taxed, although liable under the law, the same as apothecaries and druggists. The whole subject was finally referred to the Committee on Legislation, with the instruction to examine into the matter, to memorialize the Legislature for the repeal of the law, and to prepare blank petitions for signature, to be sent to members of the association and others interested.

New members were elected, and votes of thanks were passed to the druggists, the citizens and the press of Reading for the many courtesies extended. Dr. Ziegler responded on behalf of the druggists and apothecaries of Reading, and stated that they had formed an organization some years ago, but had concluded not to hold meetings at regular intervals; the members were called together whenever a subject of sufficient importance made it desirable.

Prof. Maisch exhibited and briefly described a number of new and rare drugs, and after some remarks by various members the Association adjourned, and the visiting members returned to their homes by the evening trains.

The attendance at the meeting was quite satisfactory, between forty and fifty members having been present. The total membership, we learn from the Secretary, is 66, of which but a very small number are residents of Philadelphia. Many phar-

macists and druggists residing in different parts of the State have corresponded with the Secretary, Dr. J. A. Miller of Harrisburg, and with the chairman of the Executive Committee, Mr. Chas. H. Cressler of Chambersburg. These and all others entitled to membership are invited to connect themselves now with the Association, under the following clause of the By-Laws (Chap. I, Art. 5):

"The Executive Committee shall take into consideration and report without delay on all matters of business and on all propositions of membership, and audit all bills against the Association; and, *in the interim, they, with the President, shall have the power to elect applicants for membership.*"

Augusta Pharmaceutical Association.—We have received the Constitution and By-Laws of this Association, which was organized May 11th, 1878.

St. Louis College of Pharmacy.—The Annual Meeting was held on Monday, May 27th. An election of officers, trustees and a board of pharmacy for the city of St. Louis took place, with the following result: President, Theodore Kalb; Vice President, Chas. Gietner; Secretary, E. P. Walsh; Treasurer, F. W. Sennewald; Board of Trustees—H. E. Hoelke, W. H. Crawford, M. W. Alexander, Geo. Ude and F. X. Crawley; Board of Pharmacy—Theo. Kalb, F. X. Crawley, Chas. Habicht, M. W. Alexander and I. M. Good. Votes of thanks were tendered to Dr. Chas. A. Lips, the retiring Treasurer, who, for the last twelve years, had served the College in this capacity, his annual report showing the College to be in a prosperous condition. The Board of Trustees, at a subsequent meeting, organized itself by electing M. W. Alexander chairman and Chas. Gietner Sec'y.

Pharmaceutical Society of Ireland.—At a special meeting of the Council, held at the College of Physicians, Dublin, on Wednesday, May 8th, Prof. Tichborne, Ph.D., F.C.S., was elected, unanimously, President, in place of Sir Dominick Corrigan, Bart., resigned. Dr. A. Smith, Vice-President, declined to accept the post of President, and requested the Council to allow him to remain as Vice-President of the Society. Mr. Bennett, of Kingstown, and Mr. Brunker, of Dublin, were elected to fill the two vacancies on the Council.

Pharmaceutical Society of Paris.—Mr. Méhu presided at the meeting held May 8. Mr. Stan. Martin presented a specimen of *Sapindus* with stinging hairs, which grows on the Senegal, and the fruit of which is employed there by the natives as a depurative. A note by Mr. Dufresne was read, in which he described certain falsifications of *pancreatin* and his observations of its digestive power.

Mr. Méhu directed attention to the presence of small quantities of copper in some commercial samples of *boric acid*; he had also met with a boro-tartrate of potassium having a greenish color, which, however, was not due to copper.

Mr. Coulier made an interesting communication on the drugs which are used by the Persians for *dyeing the hair*; he presented to the Society specimens of the plants from which the materials are obtained, and which proved to be the *henna* (*Lawsonia alba*, Lam.) and the *silvery indigo plant* (*Indigofera argentea*, Lin.)

EDITORIAL DEPARTMENT.

Acetic Acid Pure.—A correspondent has directed our attention to the identity of the article on page 293 of our June number, with one published years ago by a manufacturing house of New York, and on comparing the two we have found them to agree with each other, *verbatim et literatim*, with very few and entirely unimportant verbal changes. The pamphlet containing the article referred to was published in the year 1870, by Messrs. E. J. Mallett, Jr., & Co., 72 William St., N. Y.

Pharmaceutical Legislation in Pennsylvania.—We have received from our friend G. W. Kennedy a copy of the bill which was introduced at Harrisburg early in February by Hon. Mr. Ringgold, and to which we alluded in our last number. Mr. Kennedy has accompanied the "dead innocent" by some comments, from which we take the following :

"The bill was at last found in possession of the Committee on Vice and Immorality, the very last place we expected to find it, and had it not been for my friend, an associated press reporter, I would have given it up as lost. Its reference to this committee put it into the place where it properly belonged, and was very properly 'killed' by being indefinitely postponed.

"On glancing over the bill it is readily observed that it is not what the educated pharmacists of the State desire. There is no question but it was framed and worded for the interest and benefit of those who have been engaged in this dishonest and disreputable practice of selling diplomas. If the bill was intended for the good of the people, and for protecting them from unreliable and dishonest druggists in the compounding and dispensing of their medicines, why was it not brought before a body of pharmacists for their sanction or approval?

"No, this would not suit the framers of the bill, as they knew that it never would have been presented in the shape in which it was; at least, there would have been some provision made as to the standing of the institutions issuing the diplomas. You will observe by reference to Section I that it simply requires, in order to be proprietor or manager of a store, to be the possessor of a diploma from some medical college or college of pharmacy, stating that he has studied pharmacy. What a flimsy, transparent section this is! They would also have liked to abolish the Board of Examiners of the city of Philadelphia, which has done so much good for the community in preventing incompetent persons from commencing the drug and apothecary business.

"But the managers of the bill were foiled in their attempt to push this obnoxious bill through, thanks be to our Senators and members of the House. So long as we have such men to legislate for us as Senator Keefer and Representative Potts, from Schuylkill county, and others, there need be no apprehension that such a ridiculous bill may become a law; for, in order to vote intelligently, they make it their business to examine into the merits critically before voting."

G. W. K.

AN ACT

To regulate the Practice of Pharmacy and Sale of Poisons, and to Prevent the Adulteration of Drugs and Medicinal Preparations in the State of Pennsylvania.

WHEREAS, The safety of the public is endangered by want of care in the sale of poisons, whether to be used as such for legitimate purposes or employed as medicine and dispensed on physicians' prescriptions;

AND WHEREAS, The power of physicians to overcome disease depends greatly on their ability to obtain good and unadulterated drugs and skillfully prepared medicines;

AND WHEREAS, The act to prohibit the sale of academic degrees, approved May 19th, 1871, does away with the necessity of irresponsible pharmaceutical examining boards;

AND WHEREAS, The class of persons to which the preparation and sale of drugs, medicines and poisons properly belong, known as chemists, druggists, should possess a practical knowledge of the science of pharmacy in its various business relations; therefore

SECTION I. *Be it enacted etc.*, That after May 1st, 1879, no person whomsoever shall be allowed to establish or carry on within the limits of the State of Pennsylvania any retail chemical, drug, apothecary or pharmaceutical store, as proprietor or manager thereof, unless he shall have obtained from a medical college or college of pharmacy a diploma stating that he has studied pharmacy.

SEC. II. That any person who has served two years in a store where medicines are compounded or dispensed, and who has attended the lecture courses for one session in a medical college or college of pharmacy, shall be recognized as a qualified assistant, and, under the supervision of a graduate of pharmacy, he shall be permitted to compound or dispense physicians' prescriptions.

SEC. III. That every graduate of pharmacy actually engaged in the practice of his profession shall be registered as such in the office of the Clerk of the Court of Quarter Sessions of the county in which he is located. The fee for each registration shall be one dollar (\$1).

SEC. IV. That any person who shall knowingly, willfully or fraudulently falsify or adulterate, or cause to be falsified or adulterated any drug or medical substance or any preparation authorized or recognized by the Pharmacopœia of the United States, or used or intended to be used in medicinal practice, or shall mix or cause to be mixed with any such drug or medicinal substance any foreign or inert substance whatsoever, for the purpose of destroying or weakening its medicinal powers or effect, and shall willfully, knowingly or fraudulently sell or cause the same to be sold for medicinal purposes, shall be guilty of a misdemeanor, and upon conviction thereof shall pay a penalty not exceeding five hundred dollars (\$500), and shall forfeit to the commonwealth all of the article so adulterated.

SEC. V. That "the Act to regulate the Practice of Pharmacy and Sale of Poisons, etc., in the city of Philadelphia, approved April 4th, 1873," be and the same is hereby repealed; and all other acts or parts of acts inconsistent or conflicting with this act are also hereby repealed.

In addition to what Mr. Kennedy has said about this bill, we wish to call attention to the provision of Section I, requiring all who *carry on* any retail apothecary store to procure a "diploma." There are a large number of apothecaries throughout the State, particularly among the older members of the profession, who would thus have been compelled to hunt for the crooked diploma venders—provided the provision would have stood the test of law in a court of equity.

Other provisions which we especially commend to the consideration of those who desire to know "how *not* to do it," are contained in Sections II and III. Is a person a *qualified assistant* who has to learn yet how to compound even simple prescriptions? And if a person has served as errand boy or in a similar position in a dispensing establishment, and has attended a course of lectures, of which perhaps he has not grasped even the rudiments, will that make him a *qualified assistant*? A *graduate of pharmacy* was to procure registration (Sec. III); but the happy individuals who under Section I would have procured a "diploma" stating that they had studied pharmacy, we presume would have been exempt from paying the registration fee, because the bill does not declare them to be graduates, and very likely a crooked diploma fee may have been considered as a sufficient tax.

A Poison Act.—We have received the following copy of a new law, which, though it does not directly affect pharmacists, is nevertheless of interest to them. We print the law, together with some comments from our correspondent:

AN ACT

To prevent the wanton or careless use of poisons.

SECTION I. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same,* That no person shall put or expose in any public place or highway, nor on his own lands outside of his buildings, nor on the lands of any other person, any poison or admixture thereof, with the intent that the same shall be taken or swallowed by any bird, fowl or wild animal.

SECTION II. Any person violating this act shall, on conviction before any alderman or justice of the peace, be subjected to a fine of twenty dollars to the use of the Commonwealth.

"The above is an act passed at the last session of the Legislature of Pennsylvania.

"The *title* of the act is clear enough, and the premises such where *careful* legislation would be desirable. We think, however, that the author of the bill has failed in the present case to cover the ground *judiciously*.

"Leaving it to the naturalist to decide whether the potato beetle is an animal, and if so, a *wild* or domestic animal; we see in the present act no clause which extends protection to dogs, sheep, hogs, etc., which are not *wild* animals, while the question of what is a "wild animal," is left open to the judicial construction of *any alderman or justice of the peace*." B.

Diploma Selling.—We have repeatedly called attention to the fact that diploma venders in North America and Europe are reaping a harvest by selecting high-sounding titles for their imaginary institutions, or such which closely resemble those of well-known institutions of unquestioned respectability. The arrangements for accommodating dupes with all sorts of scientific honors and titles are usually made secretly, and it is not often the case that the agents who, for a valuable consideration, lend their helping hand to the transaction of a business that shuns the light, receive the merited stamp before they have even begun to embark in the new enterprise. It affords us pleasure, therefore, to republish the following letter from the "Cincinnati Eclectic Medical Journal" for April, in the hope that the writer of the letter may reap all the benefit, which his benevolence and kindness deserve:

"BERLIN, 10th of January, 1878.

"To the Eclectic Medical College, Cincinnati:

"I herewith take the liberty to inquire if you are inclined to confer the degree of a Doctor in absence on qualified and respectable parties. I could labor for you with the best success, if you would elect me as a delegate for Europe. I have acted till now in this capacity for qualified persons for the American University of Philadelphia, American University of New Jersey, and Nova Anglica University, Manchester, New England, but would prefer to work for an university of your well-known reputation. I would endeavor to arrange matters in such a manner that the good name of your university will not suffer, as I will confer the degree of a doctor only to such parties as are entitled by their previous studies. I require diplomas as a Doctor of Medicine and a Doctor of Dental Surgery. Therefore, if the laws of your country allow that you grant the degree of a Doctor in absence, I beg you to inform me at what price you would confer the promotion, that is, how much the fee for each diploma will be.

"With the assurance that the good name of your university will be preserved, and that I will further your interest to the best of my ability, I look for an early reply. I remain, yours, respectfully,

"DR. H. RUMLER, M. D., Hollmannstrasse No. 40, Berlin."

The introduction of the metric system into the United States has been very materially furthered by an order, dated April 27, 1878, which, with the approval of the Secretary of the Interior, has been issued by John M. Woodworth, Surgeon-General, United States Marine-Hospital Service. The medical officers of this service will hereafter be required to discard the apothecaries' weights and measures, and to express quantities by weight only in "grammes" and "centigrammes," and quantities by measure in "cubic centimetres." To facilitate compliance with this important order a pamphlet has been published containing rules for converting the old into metric values, suggestions for writing metric prescriptions, a metric posological table, etc., which have been prepared with commendable care, by the Chief Clerk and Acting Medical Purveyor, Prof. Oscar Oldberg, Phar.D. We copy from the rules and explanations the following:

¹ We regret that the Surgeon-General has not sanctioned the simpler orthography adopted by the American Metric Bureau.

1.—TO EXPRESS QUANTITIES BY WEIGHT OF THE APOTHECARIES' SYSTEM IN METRIC TERMS, OR TO WRITE MEDICAL PRESCRIPTIONS IN METRIC WEIGHTS.

RULE A.—*Reduce each quantity to grains; then divide the number by 10, (or move the decimal point one place to the left,) and from the quotient subtract one-third.* The remainder is in each case the number of grammes representing (nearly) the same quantity. Or,

RULE B.—*Reduce each quantity to drachms, and multiply the number by 4.* The product is in each case the number of grammes representing (nearly) the same quantity. Or,

RULE C.—*Reduce each quantity to ounces, and multiply the number by 32.* The product is in each case the number of grammes representing (nearly) the same quantity.

One gramme is equal to 15'43234874 troy grains (*Professor Miller*).—In preparing the above rules the fraction has been ignored, as for medical and pharmacal purposes one gramme and 15 troy grains may be safely considered as equal quantities. In rule A, therefore, a division of 15 may, if preferred, be substituted for the division by 10, followed by a subtraction of one-third from the quotient, with the same result. The difference between 15 and 15'43234874 is 2'882+ per cent., and hence the deviation from exactness in the answer arrived at by either of the above rules corresponds to an excess of 28'82+ grains for every 1,000 grains, or about 14 grains for every ounce.

To insure greater accuracy, if in any case deemed necessary, three per cent. may be deducted from the answer arrived at by either of the Rules A, B and C. The deviation from exactness will then be reduced to one-fifth of one per cent., the remainder being less than the exact equivalent sought by only 2'04 grains for every 1,000 grains, or about one grain for every ounce.

2.—TO EXPRESS QUANTITIES BY MEASURE OF THE APOTHECARIES' SYSTEM IN METRIC TERMS, OR TO WRITE MEDICAL PRESCRIPTIONS IN METRIC CUBIC MEASURES.

RULE D.—*Reduce each quantity to minims; then divide the number by 10, (or move the decimal point one place to the left,) and from the quotient subtract one-third.* The remainder is in each case the number of cubic centimetres representing (nearly) the same quantity. Or,

RULE E.—*Reduce each quantity to fluid drachms, and multiply the number by 4.* The product is in each case the number of cubic centimetres representing (nearly) the same quantity. Or,

RULE F.—*Reduce each quantity to fluidounces, and multiply the number by 32.* The product is in each case the number of cubic centimetres representing (nearly) the same quantity.

One metre is equal to 39 370432 inches (*Captain Clarke*).—Hence one cubic centimetre is equal to 0.0610253868—cubic inches, or to 16'2311678+ minims, (there being 61,440 minims in each wine-gallon of 231 cubic inches). In preparing the above rules 1 cubic centimetre and 15 minims have been considered as equal quantities, which, for medical and pharmacal purposes, is deemed sufficiently accurate. In Rule D, therefore, a division by 15 may, if preferred, be substituted for the division by 10, followed by a subtraction of one-third from the quotient, with the same result. The difference between 15 and 16'2311678+ is 8'208—per cent., and hence the deviation from exactness in the answer arrived at by either of the above rules corresponds to an excess of 82'08—minims for every 1,000 minims, or about 41 minims for every fluidounce.

To insure greater accuracy, if in any case deemed necessary, 8 per cent. may be deducted from the answer arrived at by either of the Rules D, E and F. The deviation from exactness will then be reduced to less than one-half of one per cent., the remainder being less than the exact equivalent sought by only 4'49—minims for every 1,000 minims, or less than 2¼ minims for every fluidounce.

We are pleased that official sanction has been given to this very simple method of familiarizing physicians with the use of the metric system, and thus set at rest the groundless fears of dangerous inaccuracy occurring in consequence of the conversion of old values into their approximate metric equivalents. It will also be observed that for liquids of the spec. grav. of water weights may be substituted for measures, since 1 gram=1 cubic centimeter. It would seem then as if there was but little if any difficulty of abandoning measures altogether in prescriptions in favor of weights, as we have repeatedly taken occasion to advocate. It affords us pleasure to refer to a paper, by Dr. E. Wigglesworth, which was recently published in the "Boston Medical and Surgical Journal," and strongly urges the course indicated. There is a slight inaccuracy in that paper, which, however, does not detract from the value of the argument; the author has overlooked the fact that the apothecaries' grains,

drachms and ounces formerly in use in Prussia, were *not* identical with the corresponding Troy values, but were almost equivalent to our apothecaries' measure, weighed as water. We give place to the concluding remarks of Dr. Wiggleworth's paper :

In our old "systemless system" some fluids were measured. How shall we obtain, with weights, the desired bulks of fluids with varying weights? Must we learn the specific gravities of all fluids? *Not at all!*

1. Fixed oils, honey, liquid acids and chloroform, must at present be prescribed in our old weights, not measures, according to the Pharmacopœia. Here change old weights to metric ones.

2. Not enough chloroform or ether is included in any one prescription to admit of harm arising from the amount contained in a single dose, even were their weights regarded as the same with that of water. Moreover, it is not difficult to remember that ether weighs seven-tenths as much as water, chloroform twice as much as ether.

3. There remain infusions and tinctures, glycerins and syrups. These four are used in bulk as doses, or as solvents or vehicles. The former two may be regarded as identical in weight with water; the latter two as one-third heavier, and when prescribing these we need merely write, by weight, for four-thirds as much as we should write for were we prescribing water, and we obtain an equal bulk. The teaspoon or tablespoon dose will then contain the desired amount of the drugs employed.

Or, simplest of all, we can make any mixture up to any desired bulk by merely directing the druggist to use enough of the vehicle to bring the whole mixture up to the requisite weight for that bulk.

The Metric Bureau, 32 Hawley street, Boston, will furnish metric prescription-blanks to order, to druggists or physicians, at four-fifths printers' rates, or any blank can be made sufficiently metric by a perpendicular line at the right, headed *Grams*.

OLD STYLE.

℥i or gr. i . . . equals
f5i " 5i . . . "
f3i " 3i . . . "

METRIC.

Gms.

66

4

32 |

The decimal LINE instead of POINTS makes errors impossible.

A teaspoon is 5 Gms; a tablespoon, 20 Gms.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Medicinal Plants, being descriptions with original figures of the principal plants employed in medicine, and an account of their properties and uses. By Robert Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Philadelphia: Lindsay & Blakiston. Parts 27 and 28. Price, \$2.00 each.

The parts of this excellent work now before us contain *Acoritum ferox*, *Wall.* (yields bish or bikh root); *Acon. heterophyllum*, *Wall.* (used in India as a tonic and antiperiodic); *Andropogon nardus*, *Lin.* (yields oil of citronella); *Capsicum fastigiatum*, *Blume* (bird-pepper or chillies); *Cicuta virosa*, *Lin.* (water hemlock); *Daucus carota*, *Lin.*; *Glycyrrhiza glabra*, *Lin.*; *Liquidambar orientale*, *Miller* (yields storax); *Matricaria chamomilla*, *Lin.*; *Melia azadirachta*, *Lin.* (the nimor margosa of India); *Oenanthe crocata*, *Lin.* (water dropwort of Western Europe); *Origanum vulgare*, *Lin.*; *Papaver somniferum*, *Lin.*, and *Piper cubeba*, *Lin.*

Die allgemeinsten chemischen Formeln, ihre Entwicklung und Anwendung zur Ableitung chemischer Verbindungen. Von Dr. C. Willgerodt, Docent der Chemie an der Universität zu Freiburg. Heidelberg: Carl Winter's Universitäts-Buchhandlung 1878. 8vo, pp. 208.

Chemical formulas generalized, their evolution and application for the derivation of chemical compounds.

As indicated in the title, this work is not intended for a mere enumeration of the

elementary or empirical formulas of the various chemical compounds. On the contrary, it aims at producing a general mathematical formula for all compounds, from which the rational formula of any compound may be deduced, bearing in mind the different quantivalence of the elements or groups of elements entering into combination. The subject is one of especial interest and importance in theoretical chemistry, and has been treated in a very commendable manner. It is impossible, however, in the brief space allotted to this review to follow the author in his evolution of the generalized formula, and to give the latter without the preceding considerations would be of no avail.

In an appendix, the author has arranged a number of formulas regarding all elements as being of the same chemical value (univalent), but reserves for future consideration to determine the general applicability of such a theory. There is no difficulty in the way of this view as long as the compounds consist of one atom each of two elements; but with a larger number of one or both it is different, and we believe it will be of interest to our readers to learn, from a few examples, the shape which the formulas of some well known compounds would assume. Water, $H_2O = (O'-H')'H'$; oxide of potassium, $K_2O = (O'-K')'K'$; hydrate of sodium $NaHO = (O'-Na')'H'$; ammonia, $NH_3 = [(N'-H')'-H']'H'$; acetylene, $C_2H_2 = (C'-H')'(C'-H')$, etc.

Proceedings of the Connecticut Pharmaceutical Association at the Second Annual Meeting, held in New Haven, Conn., Feb. 6th, 1878. New Haven. Pp. 43.

The meeting was opened by the President, Nathan Dikeman. The reports of officers and committees were presented and the usual routine business transacted. The draft of a proposed pharmacy act was submitted, discussed and adopted, and a committee appointed to present it to the Legislature and urge its passage. Nine papers on practical subjects and affairs of the Association were read and referred for publication. The following officers were elected to serve for the current year: President, Hugh H. Osgood, Norwich; Vice Presidents, Dwight Phelps, West Winsted, and F. V. Perry, Danbury; Secretary, Romanta Wells, New Haven; Treasurer, George P. Chandler, Hartford.

Eighth Annual Report of the State Board of Pharmacy, made to the General Assembly 1878. Providence, R. I.

During the past year fourteen persons applied for registration as pharmacists, ten of whom passed on the first, three on the second and one on the fourth examination. Of six applicants for registration as assistants three passed on the first and one on the second examination.

Sixth and Seventh Annual Reports of the Alumni Association of the College of Pharmacy of the City of New York, 1877-78. New York. 8vo, pp. 59.

Third Annual Report of the Alumni Association of the St. Louis College of Pharmacy. St. Louis, Mo., 1878. 8vo, pp. 53.

The organizations whose reports are before us have the praiseworthy object to unite the graduates into closer fellowship, and to advance the interests of the institutions where the graduates have received their pharmaceutical honors. Local in character, such associations nevertheless exert a laudable influence in more distant localities by promoting good feeling among its members wherever they may reside, and by renewing through these annual publications the bond of union which naturally centers in the *Alma Mater*. The graduates of the different colleges of pharmacy, whose only object has not been to obtain the coveted degree, attach themselves to an association the ultimate aim of which, obviously, is the promotion of pharmaceutical education and pharmaceutical progress.

Prescription Writing, designed for the use of medical students who have never studied Latin. By Fr. H. Gerrish, M.D., Professor of Materia Medica and Therapeutics in the Medical School of Maine. Second edition. Portland, Me.: Loring, Short & Harmon. 1878. 16mo, pp. 51.

This little work is intended to instruct not in the art of prescribing, but in the proper construction of prescriptions in Latin. With this end in view, it gives some simple rules, and afterwards some classified lists of words used in prescriptions, intended to aid those who are ignorant of Latin to avoid mistakes which are bad enough in written prescriptions, but infinitely worse when printed. We commend the little book to physicians and apothecaries who desire to improve in the correct writing and reading of prescriptions.

The following pamphlets have been received:

Fluid Extracts by Repercolation. By E. R. Squibb, M.D., Brooklyn, N. Y. Reprinted from the "Am. Jour. Phar.," May, 1878, with additions by the author. Pp. 43.

Studien über die Zusammensetzung des Holzes. Inaugural-Dissertation von Arthur Stackmann. Dorpat, 1878. 8vo, pp. 60.

Researches on the Composition of Wood.

Is Modern Education Exerting an Evil Influence upon the Eyesight of our children? By A. W. Calhoun, M.D., Professor, etc., Atlanta Medical College. Pp. 18.

Is Phthisis Pulmonalis Contagious, and does it belong to the Zymotic Group? By W. H. Webb, M.D., Philadelphia. Pp. 38.

A New Treatment of Skin Diseases. By Meigs Case, M.D., Oneonta, N. Y. Pp. 8.

Fifty fifth Annual Report of the Managers of the State Lunatic Asylum, Utica, N. Y., for 1877. Pp. 96.

Lithotomy. A tabulated statement of cases with considerations, etc. By David Prince, M.D., Jacksonville, Ill.

Laparo-Elytrotomy, a substitute for the cesarean section. By T. Gaillard Thomas, M.D., New York. Pp. 25.

The Intro-venous Injection of Milk as a substitute for the Transfusion of Blood. By T. Gaillard Thomas, M.D., New York. Pp. 19.

The Vest-Pocket Anatomist (founded upon Gray). By C. Henri Leonard, A.M., M.D., Detroit. 16mo, pp. 60.

Eulogy upon Lunsford P. Vantell, M.D. By Theo. S. Bell, M.D., Louisville, Ky. Pp. 22.

OBITUARY.

FELIX HENRI BOUDET died at Paris April 6th, having nearly completed his 72d year. He was born in the same city May 22d, 1806, became a pharmacist, and in 1833 received the diplomas of Doctor of Sciences and of Pharmacy. In competing for the first one of these degrees, he had instituted researches and wrote a thesis "on the action of hyponitric acid upon the oils," in which he pointed out the difference in its behavior to the drying and non-drying oils. Soon afterwards, he took charge of his father's officine, which he sold in 1849 to Edmond Robiquet, and henceforth devoted all his time to scientific researches. He was a member of the most prominent scientific bodies of France, and in 1852 was appointed to the Conseil d'hygiène et de salubrité of Paris. Of his numerous scientific memoirs many have been noticed in this journal, notably several on strictly pharmaceutical subjects, which were published about 30 years ago.

THE AMERICAN JOURNAL OF PHARMACY.

AUGUST, 1878.

NOTE ON THE RESIN OF PODOPHYLLUM.

BY FREDERICK B. POWER.

Since the publication of my paper on the resin of podophyllum,¹ at which time attention was called to the possible pre-existence of proto-catechuic acid in the rhizome, an opportunity has been extended for pursuing the investigation in this direction. The material worked upon, prepared in the laboratory of Dr. E. R. Squibb, was very kindly sent by him to Prof. Flückiger, who was so kind as to place it at my disposal. It consisted of the washed and dried precipitate produced by lead acetate in the mother liquors obtained in the preparation of podophyllum resin from 400 pounds of powdered rhizome, and this, as stated by Dr. Squibb, was a portion of a lot of 1,000 pounds of rhizome, all practically the same in quality. For complete precipitation, twelve pounds, avoirdupois, of crystallized lead acetate were employed, the washed and dried precipitate therefrom weighing about ten ounces.

This lead precipitate, consisting of the lead compound of the acid resin associated with a small amount of lead chloride, was finely powdered, suspended in water, and saturated with hydrosulphuric acid, the liquid filtered to separate the lead sulphide, which latter was again suspended in water and treated as before, in order to insure the complete removal of the lead. The lead sulphide was then dried, and exhausted with boiling alcohol. The amount of acid resin as obtained by the evaporation of the aqueous liquid upon the water-bath was 60 grams. By the evaporation of the alcoholic solution, obtained by the subsequent exhaustion of the lead sulphide, 40 grams of resin were obtained; the resin being so much more sparingly soluble in water than in alcohol that the extraction of the entire amount produced by the decomposition of the lead compound would have required repeated

¹ "Proc. Am. Pharm. Assoc.," 1877. pp. 420-433.

treatment with large amounts of water. The acid resin was then further examined, as detailed in my previous paper,¹ by exhaustion with ether, and treating the portion soluble therein (which should contain the protocathechuic acid if present, associated with resin) with boiling water. The final product, thus obtained, consisted chiefly of amorphous resin, and all efforts to isolate a crystalline compound therefrom, which would admit of a more minute examination, were unsuccessful. Although the peculiar character of the resin in being soluble in water presents a great barrier for a thorough separation and examination of its constituents, yet from the amount of material operated upon, and without reliance alone upon color tests, the conclusion must be drawn that protocathechuic acid can as yet only be obtained as a decomposition product, and its pre-existence in any drug must still remain a subject for future observation and discovery.

In the course of this investigation notice was also again taken of the statement of Prof. Mayer, made some years ago,² in regard to the presence of a colorless alkaloid in the rhizome, which may be precipitated by lead or by acids. That such an alkaloid exists, which is precipitated by lead salts, seems quite improbable, and the results of the present investigation have also failed to indicate its presence; in this respect but more fully confirming the results of my previous investigation. That the alkaloid Berberina is absent, the writer believes to have quite conclusively proven, and may be supported by the observation of Dr. E. R. Squibb, who has more recently subjected a liter of the filtered liquid, obtained by the precipitation of the resin, to the action of Mayer's solution of mercurio-potassic iodide, but with *negative* results. It may not be inopportune, in this connection, to call attention to the fact which, if generally known, is not always considered, that Mayer's solution of mercurio-potassic iodide, as well as other commonly-employed alkaloidal reagents, produce precipitates with many other substances beside alkaloids, which may possibly have led other investigators astray in assuming the presence of an alkaloid in the rhizome of *podophyllum*.

In view of this fact, we can only be justified in assuming such reactions as simply indicative, but by no means as furnishing conclusive evidence of the presence of an alkaloid: the latter only to be established by its isolation and identification.

¹ *Ibid.*

² "Amer. Jour. Pharm.," March, 1863, vol. xxxv, p. 98.

ASSAY OF COMMERCIAL EXTRACTS AND RESINS OF JALAP.

BY CHAS. D. FARWELL, PH.G.

(*From an Inaugural Essay.*)

The examination of a few commercial extracts and resins of jalap, for the purpose of comparing them in regard to purity and the relative amount of medicinally active constituents contained therein, was conducted in the following manner:

One gram of each extract was dried over sulphuric acid and weighed, to ascertain the amount of moisture present. Ten grams of each extract were exhausted by water, and the residual resins, after being dried and weighed, were treated with stronger ether to separate the soft from the hard portion. The ethereal solutions, being allowed to evaporate, yielded the *soft resins*, which were weighed and dissolved in officinal solution of potassa, forming clear, deep reddish-brown solutions, the color probably being due to the action of the alkali on a peculiar coloring principle. When dilute hydrochloric acid in excess was added to these alkaline solutions, either hot or cold, dense light-colored precipitates were thrown down. In this respect the soft resin of jalap differs decidedly from the resin of scammony, with which some chemists have claimed it to be identical. Resin of scammony is wholly soluble in ether and officinal solution of potassa, but is *not* precipitated from its alkaline solution upon the addition of dilute hydrochloric acid in excess.

The *hard resins*—convolvulin of Mayer—were also weighed and dissolved in officinal solution of potassa. When dilute hydrochloric acid in excess was added to these solutions, either hot or cold, no precipitate was occasioned, the convolvulin having been converted by assumption of water into soluble convolvulinic acid.

The aqueous solutions from the extracts were evaporated, and the residues, after being weighed, were exhausted by stronger alcohol to ascertain the amount in each soluble in both alcohol and water.

In examining the commercial resins, one gram of each was dried, weighed, exhausted by water and again dried and weighed, to ascertain the amount of moisture and extractive matter present. One gram of each, previously exhausted by water and dried, was treated with stronger ether to separate the hard and soft resins. These, after being weighed, were treated with officinal solution of potassa and dilute hydrochloric

acid, in the same manner as the resins from the extracts, and with like results.

To insure correctness, each of the operations were repeated with fresh portions of the preparations. The quantitative results are given in the following tables, samples from the different manufacturers being designated by numbers, as follows: No. 1 being from a New York manufacturer, while 2, 3 and 4 were made by different firms in Philadelphia. Resin No. 4 was made by myself by the process of the U. S. Pharmacopœia.

EXTRACTS contained	1	2	3	4
	per cent.	per cent.	per cent.	per cent.
Water,	7'5	13'0	13'4	11'7
Resin,	24'0	24'5	18'7	16'3
Soluble in water,	68'5	62'5	67'9	72'0
Soluble in both alcohol and water, .	26'0	27'0	24'0	19'0
Resins from Extracts soluble in ether, .	8'5	10'8	16'3	14'7
“ “ “ insoluble “	91'5	89'2	83'7	85'3

RESINS	1	2	3	4
Water,	3'0	4'0	3'5	
Soluble in water,	trace	trace	2'3	
Soluble in ether,	6'5	9'0	9'7	5'3
Insoluble in ether,	93'5	91'0	90'3	94'7

The behavior of the resins when separated by ether and treated with solution of potassa and dilute hydrochloric acid was considered sufficient proof of purity, the difference in the proportion of the active constituents being, no doubt, mainly due to the quality of the drug used, and perhaps in part to the manner of preparation. It will be seen by the foregoing tables that this difference consists chiefly in the relative proportion of the resin contained in the extracts, and it is, of course, upon the resin that the activity of the extracts *chiefly* depends, although the portion soluble in both alcohol and water has been proven to be pos-

sessed of valuable mild cathartic and diuretic properties. Only²one of the commercial resins contained matter soluble in water, and³this was found to be principally sugar.

Although neither of the preparations examined may be considered poor, and *fair* results might be attained from the employment of any one of them medicinally, the use of inferior drugs or improper manipulation by the manufacturer to *any* extent should not be encouraged, nor should the pharmacist be satisfied with even a good preparation when there is a better or a best.

There is no doubt that what is true of so many of the preparations usually purchased from the manufacturer is also true of the extract and resin in jalap: this is, that the pharmacist, by the use of proper care in selecting the drug, can himself produce a preparation fully equal, if not superior, to the best from the manufacturer.

BERBERIS NERVOSA, Pursh.

BY PETER F. NEPPACH, PH.G.

(Abstract from an Inaugural Essay.)

This is the *Mahonia glumacea* of De Candolle, known in Oregon as *Oregon Grape*, and is indigenous to California, Oregon and Washington Territory, principally in the Coast Range and Cascade Mountains, from Vancouver Island to the Bay of Monterey. The part used in medicine is the rhizome, which is horizontal in the ground, very knotty and crooked, from the size of a quill to an inch in diameter, and has a very thin bark of a dingy yellowish-brown color externally, somewhat lighter internally, and covering a white tough wood. It is regarded as possessing tonic and febrifuge properties and has been used in syphilitic complaints with asserted success.

The whole rhizome was crushed to a coarse powder, macerated with alcohol, the tincture concentrated, thrown into water and filtered from the yellow resinous precipitate; the filtrate was somewhat concentrated and well acidulated with hydrochloric acid, when a bright-yellow powder was obtained, the warm alcoholic solution of which, treated with a dilute solution of iodine in iodide of potassium—being careful to avoid excess of iodine—gave a bronze-green precipitate. The yellow powder was compared with hydrochlorate of berberina, pre-

pared from hydrastis, in its behavior to various reagents ; the reactions being identical, proved the identity of the substance with berberina.

On examining the yellow precipitate occasioned in the concentrated tincture by water, it was found to contain more berberina, and possibly another alkaloid, which, however, was not isolated.

The powdered rhizome, previously exhausted with strong alcohol, was treated with water. The infusion, on being tested with the usual reagents for alkaloids, gave no reaction ; it contained, however, gum and sugar.

ON the SPECIES of BERBERIS of the PACIFIC COAST.

By JOHN M. MAISCH.

The genus *Berberis* comprises shrubs, which have a more or less yellow wood and a yellow inner bark, and produce racemes of yellow or yellowish flowers, and several-seeded acidulous berries. As at present constituted, about 50 species are known which belong to both continents, but are largely South American. One species, *Berb. vulgaris*, Lin., is indigenous to Europe, has been naturalized in New England and grows spontaneously in other parts of the United States. It has the early leaves reduced to sharp, usually triple spines, from the axils of which deciduous, obovate, spatulate, bristly, serrulate leaves without pointed petioles, are produced. The shrub grows 6 to 8 feet high, while the only species indigenous to the eastern section of the United States is but 1 to 3 feet high. This is the *Berb. canadensis*, Pursh, which, however, according to Gray, is not indigenous to Canada, but grows in the Alleghanies of Virginia and southward ; it has repandly-toothed leaves and few-flowered racemes.

A larger number of species are found in the Western United States, in the territory bordering the Pacific. All of them are, however, very different in aspect from those noticed above, the differences having been considered so important that the plants were arranged by Nuttall into a separate genus, *Mahonia*, which was also adopted by De Candolle, but has more recently been regarded merely as a sub-genus of *Berberis*, from which it is distinguished by evergreen oddly pinnate leaves with sessile spinulously-toothed leaflets, by the absence of glandular spots at the base of the petals and by the presence of a tooth on each side of the apex of the filament. While the berries of the species noticed above are of a bright-red or scarlet color and oblong or



BERBERIS REPENS, *Lindley*.
Leaf, one-half of natural size. Leaflet, natural size.

oval in shape, the species of our Pacific coast have globular dark-blue berries. On that account it seems they are indiscriminately called *Oregon grape*; it will at least be observed from the statements below, that Pursh included *Berb. repens* in his *Berb. aquifolium*, to which, it is asserted, the name of Oregon grape is usually given, and Mr. Neppach informed us that the plant analyzed by him (see page 373) is known by the same name in those parts of Oregon where it grows. All the species resemble one another so closely, and they all vary in aspect to such an extent, that it will be very difficult for others than botanists to distinguish them. It appears also that these plants have been used indiscriminately on the Pacific coast for many years, and it is not unlikely, that they are indiscriminately collected and used as *Berberis aquifolium*.

As indigenous medicinal agents, they certainly deserve the attention of physicians; but we doubt that they will be found to possess greater efficacy or markedly different properties than the numerous drugs which contain notable quantities of berberina.

Excellent descriptions of these plants are contained in a work recently published under the title: "Geological Survey of California. Botany, vol. i, Polypetalæ: by W. H. Brewer and Sereno Watson. Gamopetalæ: by Asa Gray." With the annexed plate of *Berb. repens*, Lindl., for the use of which we are indebted to Mr. C. G. Lloyd of Cincinnati, we publish the descriptions of all the California species, and merely remark, as to the venation, that the *pinnate* venation is well marked in the plate, and that the leaflets of *Berb. nervosa* before us have, aside from their different shape, one or two veins on each side of the mid-rib originating at the very base thereof. The leaflets of *Berb. aquifolium* differ from those figured in being narrowed towards the apex.

Leaflets Pinnately Veined.

Berberis repens, Lindl.—A low, somewhat procumbent shrub, less than a foot high; leaflets 3 to 7, ovate, acute, not acuminate, 1 to $2\frac{1}{2}$ inches long, not shiny above; racemes few, terminating the stems, 1 to $1\frac{1}{2}$ inch long. *B. aquifolium*, Pursh, mainly and of numerous authors. Throughout California, and extending northward to British Columbia and eastward to Colorado and New Mexico.

B. aquifolium, Pursh.—A shrub 2 to 6 feet high, leaflets usually 7, but often more, the lower pair distant from the stem, ovate to oblong-lanceolate, $1\frac{1}{2}$ to 4 inches long, acuminate, green and shining

above, sinuately dentate with numerous spinose teeth ; racemes $1\frac{1}{2}$ to 2 inches long, clustered chiefly in the subterminal axils ; fruit nearly globose.

Frequent in Oregon and northward, where it is known as the "Oregon grape," and reported southward in the coast ranges even to Monterey. Pursh's description and figure belong mainly to *B. repens*.

B. pinnata, Lag.—Very much like the last species, but the leaves more crowded and more nearly sessile, the lower pair of leaflets being approximate to the base of the petiole ; leaflets usually 5 to 7 ; racemes more frequently lateral upon the branches ; fruit oblong, ovoid, 4 lines long. *Mahonia fascicularis*, D. C.

Hills about San Francisco Bay and eastward to San Diego, thence east to New Mexico. Fruit pleasant to the taste and known to the Mexicans as *Leña amarilla*. There has always been much confusion, and is still some uncertainty respecting this species and its allies. Lagasca's original description (published in 1803) professedly included specimens both from Monterey and from Vancouver Island, while the plant cultivated in the gardens from his seeds, and figured under this name, appears to have been wholly the Oregon form, which Pursh afterwards included with the low *B. repens*, in his description and figure of *B. aquifolium*. Humboldt and Bonpland afterwards applied the name *B. pinnata* to a Mexican plant, figured by them, and DeCandolle at length included all, the Mexican, Californian and Oregon together, under the name *Mahonia fascicularis*. The question of synonymy is most conveniently solved by retaining what has become the ordinary application of the names, *B. fascicularis* being limited to the Mexican species, which seems distinguishable from the Californian *B. pinnata* by its more numerous, more acuminate and less shining leaflets.

Leaflets Palmately Nerved.

B. nervosa, Pursh.—Stems simple, but a few inches high ; petioles and peduncles springing from the apex, accompanied by dry glumaceous rigidly acuminate bracts ; leaves 1 to 2 feet long, of 11 to 17 ovate acuminate leaflets ; racemes elongated ; pedicels short ; fruit larger than in the preceding species, 3 to 4 lines in diameter. *Mahonia glumacea*, D. C.

Near the coast from Monterey to Vancouver Island.

ON THE VOLATILITY OF GLYCERIN.

CINCINNATI, June 27th, 1878.

To the Editor American Journal of Pharmacy :

In Dr. Squibb's article on "fluid extracts by repercolation," published in the May number of the "Journal," he states that on evaporating to constant weight a mixture of glycerin, alcohol and water,

containing 20 per cent. by weight of glycerin, only 16 per cent. of residue was obtained, showing that 20 per cent. of the glycerin in the mixture had been carried off with the vapor of the alcohol and water. This result seemed so at variance with the recognized non-volatile character of glycerin that the following experiments were made to test it, the results of which do not at all accord with Dr. Squibb's theory.

A mixture of glycerin, water and alcohol was made in the same proportions used by Dr. Squibb. The glycerin was taken from a five pound can opened expressly for the purpose, and tested by exposing a carefully weighed quantity to the heat of a water bath, for 30 minutes, during which time it lost no appreciable weight, showing that it lost no water at this temperature. In this, as in the other experiments, the liquid was weighed in a tared watch glass set in a second one, the two being used to avoid loss from "creeping" of the liquid over the edge of the glass. They were then set, together, in a large porcelain dish, heated over boiling water and covered. The temperature of this "air bath" was shown to be 170° to 180°F. , by a chemical thermometer. Each evaporation was carried to constant weight. The glycerin mixture, containing 20 per cent. of glycerin, was kept in a well stopped bottle to avoid concentrations by evaporation of the alcohol.

Four experiments gave residues weighing in per cents. as follows: 20.1, 20.5, 20.3, 20.6; mean result, 20.4 per cent. The 0.4 per cent. excess is due to the rapid evaporation of the alcohol during mixing and weighing, thus concentrating the solution of glycerin.

Two experiments were made with a mixture of strong alcohol and glycerin, with 30.8 per cent. of the latter; the residue weighed 31.0, 31.5; mean, 31.3 per cent. Excess slightly greater than before.

Glycerin 16.7 per cent., water 83.3 per cent. gave, under the same treatment, residues weighing 16.5 and 16.5 per cent.

These results show no loss of glycerin whatever; the results obtained by Dr. Squibb must have been due to some cause other than the volatility of glycerin in the presence of alcohol and at atmospheric pressure.

NAT. W. LORD, E.M.,
Analytical Chemist.

A NEW DEVICE FOR MOULDING SUPPOSITORIES.

BY EMLÉN PAINTER, PH G.

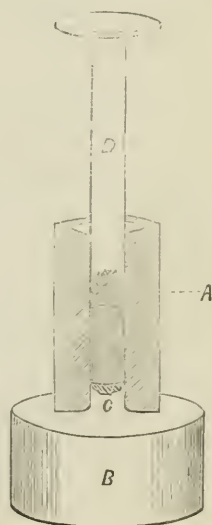
(*Read at a Meeting of the California Pharmaceutical Society, May 29, 1878.*)

It is not my intention to write an elaborate essay on the best mode of preparing suppositories, but simply to describe a little device for readily moulding the material in a convenient form, and doing it quickly and well. Although so much has been written on the subject of suppositories within the past few years, and various are the moulds to be found in the market, no contrivance for moulding them has yet been devised that seems to have met with universal favor, either from the high price at which some of the machines are held, their inefficiency or a lack of dexterity on the part of the operator.

Many pharmacists do not meet with satisfactory results in the process of melting the cacao butter and casting the material in moulds—their own fault, no doubt, for not knowing better how to do it. At best, however, it is rather a tedious and troublesome process, and in the hands of unskilled assistants, the numerous difficulties that are continually met with offer a serious objection: as for instance, sticking to the moulds; varying in size, or making ten or eleven where there ought to be twelve; and perhaps the last one cast has one-quarter of the medicament that ought to be in the dozen; and also the long time required in preparing them, besides other minor objections.

The plan of shaping the suppositories with the fingers (the one most generally adopted, perhaps) has its objections as well, but in my opinion not so important nor numerous as the objections to the melting process. The principal ones are their varying in shape, their unfinished appearance and the long time required, if pains are taken, to shape them very nicely. The lacking in uniformity is sometimes particularly noted by the patient, if the suppositories chance to be prepared a second time by a different person from the one who originally put up the prescription.

Now all the objections above noted, including that of an expensive machine, seem to be obviated by this device. It is made on the principle of Remington's pill machine for making compressed



pills—"Proc. Am. Phar. As.," 1875; "Am. Jour. Phar.," March, 1876—consisting of a cylinder, A, (as shown in the accompanying cut), $1\frac{1}{8}$ inch in diameter, by 2 inches in length, with a central bore or space, $\frac{3}{8}$ of an inch in diameter, rounded off a little at either end of the cylinder. This cylinder rests upon a cylindrical stand, B, 2 inches in diameter, by 1 inch in height, in the centre of the upper surface of which has been made a cylindrical spur, C, $\frac{3}{8}$ of an inch in height, with the upper end made slightly concave, and of such a diameter that it will nicely fit the bore of the cylinder first described. A rod, D, $2\frac{1}{2}$ inches long, is made of the same diameter as the spur, with a conically concave depression, $\frac{3}{8}$ of an inch deep, turned in one end and leaving it with a sharp edge. On the other end of the rod is made or fixed a knob that will stand a sharp blow of a mallet—the pressure of the hand I find sufficient, however, unless the suppository is made unusually long.

The machine is intended to be made of metal; brass, nickel-plated, would, perhaps, be the best. If simply made of brass, the first of a lot of suppositories made will invariably be discolored from the mould becoming tarnished, no matter what pains are taken in cleaning it.

A thin coating of silver answers quite well the purpose of protecting it, which may be given in a few minutes' time, by simply taking a solution of nitrate of silver in the proportion of twenty grains to the half ounce, and adding to this a strong solution of cyanide of potassium, just sufficient to redissolve the precipitate first formed, then add a little prepared chalk and rub the brass with this mixture. In the course of a few minutes you will have it well coated with a thin coating of silver, polished and ready for use.

In using this mould the cacao butter must first be well powdered, which can readily be done by first breaking down the larger lumps in a mortar, then adding a few drops of alcohol, and triturating until it is finally powdered. (I am indebted to Mr. G. G. Burnett for this suggestion.) The use of the alcohol is to prevent the particles of cacao butter from adhering together by the pressure and heat produced in the process of trituration, and it will be found to greatly facilitate the operation. By the time this is made fine enough, the alcohol will be nearly all evaporated. Then add the medicinal agent, and form the whole into a mass, as would be done to shape the suppositories with the fingers. The mass can always be made in this climate, without rendering the material too soft, by adding a few drops of a fixed oil,

and it is surprising the quantity of oil that can be added without perceptibly effecting the consistence or the melting point of the finished suppository. After the mass is made it can be conveniently divided into the required number of pieces, on the ordinary pill machine, by making a cylinder of it the required length (as would be done in making pills), and pressing it firmly between the divisions instead of rolling it, then separate with a spatula the several divisions made. The mass should be rolled in powdered elm or lycopodium, to prevent it from adhering to the pill machine. The next step in the process is to place the hollow cylinder of the mould in its position on the stand, drop in one of the pieces, and press it very firmly with the rod, which must be turned back and forth a few times to enable one to readily detach the suppository after it has been pushed out, then lift the upper cylinder, twisting it in the act, and push the suppository through with the rod, and it is finished.

Suppositories of any required size, between ten and thirty-five grains, can be well moulded in a machine of this size. And the cost of such a machine made to order, of brass, will not exceed three dollars; at least, that was the cost of the first one I had made (including patterns and everything) from a rough sketch made by myself. The second one made did not cost quite so much.

The same principle is also admirably adapted to making pessaries by modifying the size and shape of the mould.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

New, Convenient and Cheap Dialyzer.—Huizinga, in Groningen, recommends to make rectangular bags of moist parchment paper, fastened together with a paste consisting of a warm 15 per cent. gelatin solution, containing 3 to 5 per cent. of chromate of potassium. The dialyzers are dried and exposed to the sunlight, fastened over hard rubber frames, and tested by filling them with water. Several such bags may be suspended in one vessel, care being taken to remove the water from the bottom of the vessel with a siphon, and to continually supply fresh water above. Egg albumen, neutralized with muriatic acid, lost its soluble mineral salts in such dialyzers in the course of 24 hours, while at the expiration of 36 hours it was identical with

Schmidt's Dialyzed Albumen, no longer coagulating when heated nor causing a reaction with metallic salts.—*Phar. Post*, May 16, p. 156.

Small Ice Apparatus.—Prof. Reichardt recommends a small apparatus made of strong sheet iron, by means of which 250 to 300 grams of solid, transparent ice can be frozen in 5 or 10 minutes, in hot summer, at a trifling expense. The apparatus consists of two cylinders, the inner one of which is filled with water of 10 to 20°C., and rotates in the outer one, which contains a frigorific mixture, consisting of 1 kilo of powdered ammonium-nitrate and 1 liter of water. The ice can be easily removed from the inner vessel after dipping the latter into hot water, while the ammonium-nitrate can be regained in a pure state by filtering and evaporating to dryness.—*Archiv d. Phar.*, May, 1878, p. 446.

Determination of Fat and Water in Milk.—W. C. Heraeus uses a short and reliable process, which is as follows: A shallow silver dish, 8 cm. long, 2 cm. wide, and 1 cm. deep, containing a little glass and 10 grams of milk, is placed into an iron gas-pipe, which is connected either with a good chimney or with a Bunsen suction-tube; another pipe containing burned lime is attached, and air heated to 35°C. is passed over the lime and through the pipe containing the milk; the latter will be dry in the course of half an hour. The difference in weight indicates the water, and light petroleum benzin extracts from the residue the fat.—*Archiv d. Phar.*, May, 1878, p. 443.

Hydrochlorate of pilocarpina is recommended as a valuable substitute for the more expensive physostigmia salt. It is in white crystals, and forms a double salt with platinum, crystallizing handsomely. It is also frequently preferred to eserina as a myotic, and when injected hypodermically is considered a never-failing diaphoretic, having, however, sometimes very unpleasant emetic effects, and always increasing saliva secretion.—*Phar. Post*, May, 1878, p. 156, from *Gebe's Ber.*

Phloroglucin, a substance existing in various combinations in the vegetable kingdom, was discovered by Wiesner to be a very delicate reagent for ligneous tissue. One drop of a solution containing $\frac{1}{2}$ per cent. of it will cause a beautiful bright red coloration on a piece of pine wood on the addition of a drop of hydrochloric acid.—*Chem. Centralbl.*, May 15, from *Polyt. Jour.*

The Glucoside of Rhamnus infectorius (*French Berries*).—Liebermann and Hörmann exhaust the powdered berries by boiling 90 per cent. alcohol, decanted from a brown resinous glucoside, and collected the light yellow masses of *Xanthorhamnin*, of which more was obtained by concentrating the alcoholic mother-liquor. 3 kilos of the berries yielded about 185 grams of resinous glucoside and 183 grams of pure xanthorhamnin, which was found to be identical with Schuetzenberger's *Rhamnegin*, very soluble in cold water, soluble in alcohol, but insoluble in benzol, ether and chloroform; it crystallizes from alcohol in light yellow microscopic needles.—*Ber. Deutsch. Chem. Ges.*, May, 1878, p. 952.

Action of Reducing-Agents on the Product obtained by treating *Brucia* with Nitric Acid.—R. Roehre dissolved 1 part of brucia in 25 parts of nitric acid, spec. grav. 1.4, and allowed the red solution to stand until it turned yellow. On adding stannous chloride in excess the color changed to a beautiful dark violet, which soon became dark red, and finally colorless after slowly separating violet crystals. These are soluble in water and mineral acids with a violet, but in nitric acid with a yellow and in potassa with a greenish-yellow color, sparingly soluble in alcohol and insoluble in ether, benzol, petroleum-ether, bisulphide of carbon and amylic alcohol.

The solution of brucia in nitric acid yields with sulphide of ammonium beautiful brick-red shining needles, which are soluble in hot water and in the mineral acids with a red and in caustic potassa with a blue color.

If sulphurous acid is used in the place of stannous chloride or ammonium-sulphide, violet crystals will form, while sulphuretted hydrogen causes a light violet precipitate.—*Ber. Deutsch. Chem. Ges.*, April, 1878, p. 741.

Bixin, $C_{28}H_{34}O_5$, the coloring principle of *arnotta*, the pulp surrounding the seeds of *Bixa orellana*, *Lin.*, was obtained by C. Etti in dark red four-cornered crystalline plates, of a metallic lustre, which melt at $175^{\circ}C$. Bixin is insoluble in water, sparingly soluble in ether, alcohol, benzol, bisulphide of carbon and glacial acetic acid, more soluble in chloroform and boiling alcohol; it unites with alkalies to soluble compounds in water, reduces Fehling's solution and yields with permanganates mainly oxalic acid. It is prepared as follows: 1.5 kilo

of arnotta is digested at 80°C. with 2.5 kilos of 80 per cent. alcohol and 150 grams of calcined soda; carbonic acid gas is generated, the mixture turns brown, and the coloring principles are dissolved. The solution is filtered while warm, the residue expressed and again extracted with 1.5 kilo of 60 per cent. alcohol; the combined filtrates are mixed with half their bulk of water, and completely precipitated by a concentrated solution of soda. The precipitate is purified by recrystallizing from 60 per cent. alcohol and treatment with water and soda as before, and afterwards decomposed by hydrochloric acid in the presence of diluted alcohol.—*Ber. Deutsch. Chem. Ges.*, May, 1878, p. 864.

GLEANINGS FROM THE FRENCH JOURNALS.

BY THE EDITOR.

Drosera rotundifolia, *Lin.*, has been analyzed by G. Lugan. The fresh plant was treated by dietheralysis, the process recommended by Legrip ("Am. Jour. Phar.," 1876, p. 235). The aqueous liquid obtained thereby contained glucose, various salts and a crystallizable organic acid, which appears to be peculiar to this plant, and was also obtained from the ethereal liquid by evaporating it and treating the residue with chloroform, which leaves it undissolved, together with wax and yellow coloring matter. On evaporating the chloroform, a greenish-brown resin was left, which had a strong and characteristic odor, was exceedingly acrid and produced a burning sensation when applied to the skin.

Contrary to the observation of Reiss and Will, the author found the viscous exudation of the glandular hairs to be destitute of acid reaction, and was unable to obtain formic acid, which was stated to be the principle by which the leaves convert albuminoid matters into peptones.—*Jour. de Phar. et de Chim.*, June, pp. 465-468.

Thapsia garganica, *Lin.*—The root of this plant, which grows in Northern Africa and Southern Europe, is frequently employed in France. Perron states that there are two similar plants in Africa, called by the Arabs *bou-nefa zkar*, or male thapsia, and *bou-nefa nza*, or female thapsia, the former being the officinal and stronger one. The latter is far less acrid, has longer, broader, thicker and less divided leaves than the former, and the leaflets are frequently digitately three-lobed.—*Ibid*, p. 468.

A New Rhubarb.—M. Colin, of Verdun, has received a plant which M. Chauveau considers to be the source of Chinese rhubarb. The plant, having produced flowers, was submitted to Prof. Baillon for examination, who recognized it as a variety of *Rheum hybridum*, which he names *Colinianum*, and found a section of the root to have the characters of a pretty good rhubarb. This appears to sustain the opinion expressed by Baillon in 1876, that the Chinese rhubarb is probably obtained from several species.—*Ibid*, p. 484.

A fluid extract of ergot for hypodermic injection is prepared by Yvon in the following manner: Coarsely powdered ergot is deprived of its fixed oil by treatment with carbon bisulphide, and then dried in a dark place until the odor of the menstruum is no longer observable. The powder is then displaced with a cold solution of 4 parts of tartaric acid in 1,000 parts distilled water; the percolate is heated to coagulate albuminoids, carefully evaporated to one-third, cooled and filtered. The filtrate is digested with a slight excess of freshly-precipitated calcium carbonate to remove excess of tartaric acid, and the clear filtrate concentrated to a syrupy consistence, mixed with strong alcohol, again filtered, treated with animal charcoal, filtered and evaporated. The residue is taken up by distilled water, 0.15 gram of salicylic acid added for every 100 grams of ergot, and then enough water or cherry-laurel water to make the weight of the solution equal to that of the ergot. After several days' repose, the clear liquid is put into small vials. The fluid extract is of a handsome amber color, keeps well and is quite efficient.—*L'Union Pharm.*, May, p. 133.

Preparation of Ergotin.—P. Carles' experiments lead him to regard the following as the best process for preparing *Bonjean's ergotin*: The moderately coarse powder of ergot is exhausted by successive maceration with 2 or 3 portions of cold water. The mixed infusions are rapidly evaporated in a water-bath until at that temperature it has the density of 24°B. (about 1.20 sp. gr.) It is allowed to cool, mixed with 6 parts of 90 per cent. alcohol, the mixture set aside for 24 hours and the clear liquid evaporated to the consistence of an extract. Thus prepared, ergotin is of a homogeneous consistence, when recently made, or somewhat crummy when old, has a reddish-yellow color, a bitter somewhat piquant taste, and an odor resembling that of roast meat, when in contact with water or heated. It is very hygroscopic, has an

acid reaction, dissolves entirely in 70 per cent. alcohol and yields with water a rather turbid solution, becoming clear by the deposition of a little resin. It should not contain over 10 per cent. of moisture, and on incineration should leave not over 5.5 per cent. of ash.—*Jour. de Phar. et de Chim.*, July, pp. 45-48.

The pancreatic liquid, according to Th. Defresne, contains three distinct ferments, of which *myopsin* dissolves albumen, *amylopsin* saccharifies starch, and *steapsin* decomposes fats. The first is obtained from the pancreas of an omnivorous animal, as follows: 100 grams of a filtered solution, containing 15 grams of dried pancreatic juice, are mixed with 40 grams of acetic acid (equivalent to 7.37 grams H_2SO_4);¹ after 24 hours the mixture is filtered, and the filtrate mixed with an excess of alcohol. *Myopsin* forms garnet-colored shining scales, which are soluble in water, the solution being coagulated by heat; it digests 104 times its weight of albumen, but does not affect starch or fat.

The other ferments are best obtained from the pancreas of ruminants, for instance, the ox, which contains no *myopsin*. A concentrated filtered solution of beef pancreas is mixed with sufficient alcohol to make the mixture of an alcoholic strength of 26 volumetric per cent. The precipitate collected after 24 hours, and washed with 26 per cent. alcohol, constitutes *steapsin*, which when dry is in translucent shining scales, which are soluble in water. It has no action on starch, but decomposes 24 times its weight of fat. It is precipitated and rendered inactive by acetic acid.

To 100 grams of the liquid of beef pancreas 15.71 grams acetic acid (equal to 2.88 grams H_2SO_4)¹ are added; the precipitate is separated, and before the expiration of two hours the clear liquid is precipitated by 200 grams of 85 per cent. alcohol. After washing and drying, *amylopsin* forms lemon-yellow shining scales, which saccharify 25 times their own weight of starch, are soluble in water, the solution being precipitated by alcohol and strong acetic acid, and coagulated by heat.—*Rép. de Phar.*, June, 244-246.

Alteration of Calomel.—Mr. Jolly has determined the amount of corrosive sublimate formed from 1 gram of calomel, after digesting it for six hours, at a temperature of 40°C. (104°F.), in 100 grams of distilled water to which the following additions had been made:

¹ This indicates an acetic acid containing 23 per cent. $C_2H_4O_2$, which has the spec. grav. 1.0324.—EDITOR AM. JOUR. PHAR.

0.2 grm. muriatic acid	gave .003 HgCl ₂	0.5 grm. soda	gave .006 HgCl ₂
0.5 " sodium chloride	" .001 "	1.0 " sodium carb.	" .004 "
2.0 " citric acid	" .001 "	1.0 " magnesia	" .003 "

Calcined magnesia and calomel, each 1 gram, were mixed; on washing the powder, after 24 hours, with distilled water, .001 gram corrosive sublimate was obtained. Lime has the same effect; but, after digesting mixtures of calomel with carbonate of calcium or of magnesium and distilled water, no change was observed after six hours. Troches of calomel made with pure sugar, free from lime, did not contain a trace of corrosive sublimate after having been kept for several months.—*L'Union Phar.*, 134-136—*Gaz. Médicale*

THE BOTANICAL CHARACTERS OF DUBOISIA MYOPOROIDES, R.Br.

BY PROF. DR. DELANESSAN.

This is a handsome, erect shrub, about 4 or 5 meters high, which is indigenous to New Caledonia and some parts of Australia. The stem and larger branches are covered with a thick and fissured corky layer; the branches terminate in conical, one-sided racemose cymes of small white flowers. The leaves are alternate, somewhat decurrent, simple, elliptic-lanceolate, exstipulate, entire, narrowed at the base into a short petiole about 2 centimeters long, and there furnished with two small, lateral, narrow leaflets. The entire length of the leaf is 10 or 13 centimeters, its width near the middle $1\frac{1}{2}$ to 2 centimeters; the limb is thin, but firm, shining and smooth. The mid-rib is slightly prominent, the lateral nerves are alternate and fine. The floral leaves are shorter, sessile, elongated, narrow-elliptic and gradually reduced to short bracts.

Throughout the greater part of the year the cymes contain buds and flowers, and fruits in different stages of maturity. The flowers are hermaphrodite, with a convex receptacle, a short monosepalous cup-shaped and five-toothed calyx, and a monopetalous corolla, having a funnel-shaped tube and a somewhat bilabiate, 5-lobed limb, the lobes being induplicate and contorted in præfloration, alternate with the calyx teeth, the two posterior ones narrower, the anterior ones larger than the others. The four didynamous stamens are inserted in the corolla tube; no fifth stamen or rudiment of it could be observed, although figured by Endlicher in *Iconographia*, and admitted by Bentham and Hooker. The filaments are flattened, somewhat broader

at the base; the anthers reniform, attached by the inferior concave margin, and dehiscent by a single cleft, extending the entire length of the superior border. The ovary is superior, ovoid, two-celled, with a small disk at the base, surmounted by a cylindrical style which terminates with a nearly entire stigma, and in each cell with twelve anatropous ovules. The fruit is a two-celled, fleshy, roundish, black berry of the size of a small pea, surrounded at the base with the persistent calyx



DUBOISIA MYOPOROIDES, R. Br.

and terminating above into a short point, formed by the base of the style. The seeds, of which 2 or 4 are in each cell, are elongated, reniform, larger at one end, brown, reticulate on the surface and enclose under the hard, but brittle integuments, a rather abundant albumen, which surrounds the axile cylindrical curved embryo, pointing the radicle to the narrow end of the seed.

Duboisia myoporoides is difficult to classify. Endlicher placed it in the order of *Scrophulariaceæ*; but Bentham and Hooker amongst the

Solanaceæ, tribe *Salpiglossideæ*, near the genus *Anthocercis*, Labill. Excellent reasons may be advanced for each classification, the plant furnishing another proof of the close relation of the two natural orders, and of the impossibility of absolutely distinguishing them.—*Bull. gén. de Thérap.*, April 30, p. 362. M.

PELLETIERINA, an Alkaloid of POMEGRANATE BARK.¹

By M. TANRET.

It is usually recognized that the bark of the pomegranate, both stem and root, is active as a febrifuge in the fresh state, whilst that after drying and being kept some time it loses part of its virtue. The most natural explanation of this difference of action would perhaps be that the active principle of this bark is very liable to alteration. In previous researches, however, no such body had been met with, but the author has been successful in discovering in the bark a volatile alkaloid, which he has recently brought under the notice of the Academy of Sciences. This alkaloid he proposes to call "*pelletierina*," in honor of the learned man who contributed so largely to the history of the alkaloids.

In preparing *pelletierina* pomegranate bark (from the stem and roots) is reduced to a coarse powder; this is moistened with tolerably thick milk of lime, and afterwards lixiviated with water, and the liquor vigorously shaken up several times with chloroform. The chloroform is then separated by means of a funnel having a stop-cock and shaken with sufficient acid to render it neutral or slightly acid. In this way solutions of sulphate, hydrochlorate, nitrate, etc., of *pelletierina* can be obtained, which may be crystallized by evaporation in a vacuum over sulphuric acid. To isolate the alkaloid it may be set free by treating the saline solutions with carbonate of potash and agitating with ether or, better still, chloroform. The etherial or chloroform solution then being distilled at a gentle heat the alkali is left as a residue.

One kilogram of dry commercial bark yielded to the author by this process four grams of crystallized *pelletierina* sulphate. With fresh bark the yield would probably be greater.

¹ "Comptes Rendus," vol. xxxvi, p. 1270.

Pelletierina is of an oleaginous consistence and is colorless when obtained by evaporation of its etherial or chloroformic solution in a vacuum, but when the solution is distilled in the open air the alkaloid becomes slightly yellow. A match dipped in pelletierina burns like one saturated with an essential oil.

Pelletierina is volatile, and has a slightly stupefying aromatic odor. It gives off vapor at the ordinary temperature, and the oil spots that it forms on paper disappear after exposure to the air for a short time. It boils at about $180^{\circ}\text{C}.$, becoming strongly colored in the air, but it commences to distil at a much lower point. The alkaloid is very soluble in water, alcohol, ether, and especially in chloroform, which readily removes it from aqueous solutions.

Pelletierina is a powerful alkali, saturating acids to form salts. Upon bringing near to it a rod dipped in hydrochloric acid white fumes are formed as with ammonia. It does not precipitate solutions of the metals of the earths and alkaline earths, but it does precipitate solutions of most of the true metals. Thus it gives a white precipitate with salts of lead, mercury, zinc and silver, the last two being redissolved in excess of pelletierina. With nitrate of cobalt and with sulphate of copper it gives blue precipitates which are not redissolved in excess. It does not precipitate chloride of platinum, but it precipitates the chlorides of palladium and of gold, the last precipitate being reduced by heat. Further, like other alkaloids, it is precipitated by tannin, bromine water, iodo-iodide of potassium, iodide of mercury and potassium, iodide of potassium and cadmium and phosphomolybdic acid. The precipitate formed with tannin is soluble in an excess of the reagent; that formed with bromine water is soluble in an excess of pelletierina.

The author has prepared the sulphate, hydrochlorate and nitrate of pelletierina in crystals. These salts are extremely hygroscopic. Obtained by evaporation of their solutions in a dry vacuum they are colorless. If the neutral solutions are evaporated in a stove they become colored yellow, and at the same time by loss of part of the base they acquire an acid reaction. The salts have a slight odor, and their taste is bitter and aromatic.—*Phar. Jour. and Trans.*, June 22, 1878.

MECONOIOSIN, A NEW DERIVATIVE FROM OPIUM.

BY T. AND H. SMITH.

In the final isolation of meconin, the oleaginous-like liquid containing it, upon being left to itself for some days, sets into a mass of crystals. Those crystals, upon being drained, and cautiously washed with cold weak spirit, are to be boiled in a large quantity of water. The filtered liquid gives a crystallization of meconin, and the mother-liquor, when concentrated, and upon being set aside for a time, yields beautiful leaf-like crystalline masses of the body to which we have given the name of Meconoiosin.

This remarkable crystalline form, which, in its impure state, is assumed by meconoiosin, as well as the brown color of the crystals, enables this body to be readily distinguished from the soft and nearly white meconin, which crystallizes along with, and upon it, in a manner not unlike the incrustation of minute shells upon a rock. If this meconin be now removed, the meconoiosin, by means of a few crystallizations from hot water, with the aid of charcoal, may be obtained in the pure state, free from color.

This substance is especially interesting because that now, in it, a second chemically indifferent body existing in opium is met with. Hitherto meconin alone has been distinguished by this characteristic. Moreover, the respective chemical constitution of those two opium products reveals an apparent relation, meconin being represented by the formula $C_{10}H_{10}O_4$, and meconoiosin by that of $C_8H_{10}O_2$. Both bodies are freely soluble in alcohol and ether, but as regards their solubility in water, the two substances present a striking contrast. Meconin is very slightly soluble in cold water; and in boiling water, unless in the proportion of about 1 in 50, it refuses to dissolve, remaining at the bottom of the liquid, like a heavy oil. Meconoiosin, on the other hand, is soluble in 27 parts of cold water, while in boiling water it is soluble to almost any extent, forming as the heat rises, and before being shaken up, a syrupy solution at the bottom of the liquid.

We have not yet ascertained the boiling point of meconoiosin, but it has been heated to 280°C . without boiling. It melts at 88°C .

When heated with slightly diluted sulphuric acid, and when the evaporation has reached a certain point, meconin produces a beautiful green color. With meconoiosin, under the same circumstances, the coloration is deep red, becoming purple.

In our case at the Paris Exhibition are shown crystalline specimens of meconoiosin, both in the pure and in the impure form.—*Phar. Jour. and Trans.* [Lond.], June 8, 1878.

NOTES ON THE TANNINS.

BY B. H. PAUL, PH.D., AND C. T. KINGZETT.

In a paper recently published by Mr. H. R. Proctor he has shown that no two processes for the estimation of tannin give similar or comparable results, although when the same process is tried against products of the same nature, the results obtained by each process are tolerably constant, that is to say, cutch may be compared with cutch, mimosa with mimosa, and tannin with tannin, so long as the same process is employed; but even in this case tannin cannot be compared with cutch.

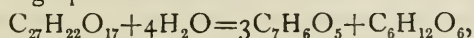
In the course of professional practice we have had occasion to examine various tanning materials, in such a way as to enable us, if possible, to value one kind of material against another; and, to make a long story short, it may be said our results fully sustained Mr. Proctor's statements. We could compare cutch with cutch, but not with ordinary gallotannic acid, as it is called, and even when each kind of substance was re-examined by different processes, varying results were obtained. Thus a sample of tannic acid (sold as pure) showed with Gerland's antimonial process 76 per cent. of pure tannin; by the volumetric process, employing lead acetate and using potassium ferricyanide as an indicator, 179 per cent.; and by the indigo process it showed (using the figures worked out by Neubauer) 135 per cent. tannin, which figure, corrected for admixed gallic acid by the gelatin and salt treatment, became 93 per cent. real tannin.

A number of perfectly unmeaning results were therefore obtained, and the difficulty was made still greater when cutch and extract of mimosa bark were similarly compared.

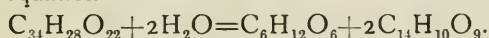
Although the term "tannin" appears to indicate that the astringent character of different plants is due to the presence of a common substance, this supposition is not only erroneous to a large extent, but it becomes delusive when an attempt is made to base analytical methods upon it. The commercial value of different materials can so far be ascertained only by the practical tanner.

If the various kinds of tannin were all glucosides, it might be possible to arrive at some sort of valuation by determining the amount of glucose which they are capable of yielding. It was this idea that led to the experiments detailed in the paper.

Strecker stated that ordinary gallotannic acid (from gall-nuts) was a glucoside, splitting up when boiled with dilute acid as follows :



but H. Schiff has recently shown that tannic acid as ordinarily prepared is only digallic acid, splitting up thus, $C_{14}H_{10}O_9 + H_2O = 2C_7H_6O_5$; and this view has been confirmed by Stenhouse in a study of the action of bromine upon tannin. Schiff, however, expresses the opinion that the unaltered natural tannin of gall-nuts may probably be a glucoside, not of gallic acid, but of digallic acid, and that it is to some extent decomposed by the mode of preparation (comp. foot-note, "Ann. Chem. Pharm.," clxx, 175). In that case its decomposition would be represented by the equation—



These statements of Schiff led us to examine a number of commercial samples of tannin, by boiling them with dilute acids and examining the products for glucose. The solution thus obtained reduced Fehling's solution, although in every case it was found to be quite free from sugar, and to contain only gallic acid. Moreover, the freedom of the original samples of tannin from any glucoside was shown by the fact that they gave no purple coloration with strong sulphuric acid alone, although when sugar was added the coloration came out strongly. This result is in accordance with the circumstance, mentioned by Schiff in a supplementary note to his paper, that tannic acid is now prepared commercially with dry ether, and not with ether containing water or with a mixture of ether and dilute alcohol. It seems, therefore, to be a matter of some doubt whether tannin is after all a glucoside even in its natural state, because if it were so, a process sufficient to effect its decomposition so far as to eliminate glucose, would scarcely stop at that stage, but would also presumably give gallic acid and not digallic acid.

As we could find nowhere any statements regarding the constituents of cutch and mimosa bark extract, further than that they both yield a peculiar acid named *mimotannic acid*, some experiments were made also with these materials.

Cutch of commerce is a hard, brownish-black, shining substance, prepared in India and elsewhere from the *Acacia Catechu*, and other trees.

The method of procedure employed in our experiments consisted in boiling cutch for a number of hours with a quantity of dilute sulphuric acid (2—5 per cent.) During this operation 5 per cent. of a dark brown insoluble matter forms, which appears to be an imperfectly changed substance, judging from its general characters and from the fact that it gives the reactions of a glucoside, only in a less degree than the original cutch. The sulphuric acid solution admits of treatment in two ways. It may be precipitated either by acetate of lead or by baryta-water, both of which reagents remove the same acid substance, and leave glucose of an unfermentable character in the filtrate. This glucose was estimated at 25 per cent. on the original cutch.

Mimosa bark is the product of the *Acacia mimosa*, and furnishes in part the cutch of commerce. Extracts made of this bark gave, by the processes just described, similar results, the sugar obtained being estimated at about 8 per cent. on the bark.

The peculiar acid removed by precipitation with acetate of lead or baryta-water deserves a few words. If lead be employed, the acid may be obtained by decomposition of the precipitate with sulphuretted hydrogen, and removal of the sulphuric acid from the concentrated filtrate by means of carbonate of barium or carbonate of lead.

If baryta-water be employed, it is best to decompose the precipitate with sulphuric acid, and then to remove the excess of acid from the filtrate in the same way.

The solution of organic acid thus obtained is of a faint red color, and shows the following reactions:

1. An intensified red color on addition of ammonia.
2. A dark color with ferric chloride, but only a trace of precipitate.
3. No appreciable reaction with ferrous sulphate.

But a solution rendered neutral with soda became much darker itself, and gave

1. With ferric chloride a dark-colored precipitate.
2. With ferrous sulphate a bluish-black precipitate.

It also gave precipitates with other reagents.

On evaporating a solution of the free acid, oxygen was evidently absorbed, and a dark-brown matter deposited on the sides of the dish.

In fact, it was impossible to concentrate the solution or to work profitably with it any further. Without attempting to describe the characters of the insoluble matter formed during the boiling of cutch with sulphuric acid, the foregoing notes may be summarized as follows :

1. The supposition that tannin, as it exists in gall-nuts, is a glucoside, is rendered doubtful, and the sugar met with in some samples of tannic acid is more probably referable to an impurity, as Rochleder and Kawalier assumed. Schiff leans to the opinion that the tannin in gall-nuts is a glucoside, but he states that the gallotannic acid met with in commerce is not a glucoside, but digallic acid.

2. The astringent principle common to cutch and extract of mimosa bark is shown to be either a glucoside or associated with a substance of that nature, since they both yield unfermentable sugar, together with a peculiar acid distinct from gallic acid.

The specimen of sugar exhibited has been purified by redissolving in water, precipitation with ammoniacal lead acetate, and decomposition of the precipitate with sulphuretted hydrogen.—*Jour. Chem. Soc.*, May, p. 217.

COMPOUNDS of SALICYLIC ACID with ALBUMINOIDS.

BY FR. FARSKY.

The author has prepared compounds of egg-albumin, casein, fibrin and syntonin with salicylic acid by several methods. Either the albuminoid and the acid were mixed together and allowed to stand with constant stirring, or the two were combined in a dialyser, or the vapor of the acid was made to act on the finely powdered substance. Whichever method of preparation was adopted, the solid substance was finally extracted by pure ether, which was shaken up with it as long as the filtrate gave a reaction with ferric salts. The albumin-compound was then washed with hot water, and dried in an air-bath at 120—130°.

Analyses showed that on the average 14.16 per cent. of salicylic acid was combined with 85.84 per cent. of the albuminoid, which points to the formula $C_{72}H_{112}N_{13}SO_{22} + 2C_7H_6O_3$. These compounds are found to be quite as easily digestible as the uncombined albuminoids, so that salicylic acid might possibly be used for the preservation of feeding-stuffs.

In connection with the above researches the author has been enabled

to make a more accurate investigation of salicylic acid, and he gives the following account of it. It crystallizes from concentrated solutions in slender, almost colorless needles, from dilute solutions in larger prismatic, very hard crystals, often very prettily grouped. If, however, other bodies are present in the solution, and more especially if they are organic bodies, regular crystals are not formed, but, according to the nature and quantity of the admixed body, either crescent-shaped, annular or tufted forms which scarcely resemble crystals, are obtained.

When the foreign body is removed the acid gradually regains the capability of forming acicular crystals. Freezing the solution also brings about the change. The acid melts at 157.5° , and sublimes at 200° , but even at 80° a considerable quantity volatilizes. Perfectly pure crystals may be obtained by heating a solid body containing the acid, or a solution of the acid at this temperature in the air- or water-bath. The acid, as is well known, splits up on boiling into carbon-dioxide and phenyl-alcohol; but it is quite sufficient to heat the solution of the acid or certain salts, especially in presence of other acids, for a long time on the water-bath, to bring about this change. Hydrated sulphuric acid decomposes salicylic acid only when it is added all at once to the solid acid or its solution.

Permanganate of potassium, especially in presence of sulphuric acid, oxydizes salicylic acid, and among other products of the decomposition are found formic and carbonic acids and water. A similar decomposition is effected by boiling the acid with potassium bichromate and sulphuric acid. If the solution of the acid is heated with the bichromate without addition of sulphuric acid, a body passes over with the steam which has an unpleasant odor; it has not been examined. When salicylic acid is brought into contact with ferric acetate, it combines with the iron, the liquid becomes of a violet color, and deposits a dirty violet precipitate of $\text{Fe}_2\text{H}_2\text{O}_4$.

This hydrate dissolves in water and forms a golden-yellow liquid, which can be concentrated, but is decomposed by contact with acids, bases, salts, alcohol, ether, and even filter paper, and rendered insoluble. If, however, the solution of the ferric salt is tolerably concentrated, and especially if the mixed solution is not too acid, a brown salicylate separates out. The acid behaves in a similar way to lead acetate; lead

salicylate is formed, and very strong vapors of acetic acid are evolved in the cold.

Salicylic acid forms three salts with ferric oxide, a normal salt, a basic salt and a so-called ferric ferro-salicylate.

Compare the author's paper on the "Application of these salts to acidimetry and alkalimetry."—*Wien. Sitzungsber.*, lxxiv. 49, from *Four. Chem. Soc.*, March, p. 224.

THE PREPARATION OF SAPO VIRIDIS.

BY E. B. SHUTTLEWORTH.

During the past two or three years several formulæ have been published for the preparation of substitutes for green soap, but, as far as my own experience goes, none of them give satisfactory results. A so-called green soap, used until lately in the hospitals here, consisted of a partly saponified, yellowish and almost odorless mass, formed by boiling together, for a considerable time, a mixture of 2 parts spermaceti and 1 of solution of potash, sp. gr. 1.300. Another formula, much nearer the mark, directs the saponification of 1 part of linseed oil by an equal weight of solution of potash, sp. gr. 1.130. The quantity of potash is, however, insufficient, and as one of the therapeutical essentials of the preparation is that the alkali be in slight excess, the effects realized are not always those which are anticipated. Lastly, we have a recipe, given in a short paper by Mr. Herman Betz, in the "*Amer. Journ. Pharm.*," from which it has been reproduced in most of the pharmaceutical serial publications of the time.

On first looking over this formula, I did not notice that the solution of potash—presumably that of the U. S. P.—is ordered in only about one-third the quantity required for saponification, and consequently any attempt to follow this recipe strictly would certainly end in failure and disappointment. Druggists are not always skilled soap-boilers, and though the operation is simple it requires considerable experience. I have, therefore, taken the liberty of correcting this error, and also beg to add a few plain and practical directions regarding the process.

In a clean pot or dish, preferably of iron or copper, and capable of containing at least three times the quantity, put 1 part, by weight, of linseed oil, heat gently and add in two portions, 3 parts in all, by measure, of liquor potassæ, U. S. P. or B. P., providing either come

up to the standard requiring 5·8 and 5·84 per cent. of hydrate of potash. Boil quietly and stir frequently until the mass becomes clear, which, with 4 ounces of oil and 12 fluidounces of liquor, will require about one hour, and with 10 pounds of oil about five hours. If, during the process, the mass becomes too thick to stir easily, add a little water. Allow the soap to become cool, but before it sets work in the coloring matter, which must be previously prepared by boiling finely powdered indigo with water until the color is formed into a thin paste. Twenty grains of indigo, boiled with 1½ ounce of water until the mixture is reduced to about 1 drachm, will answer for the soap from 4 ounces of oil. The soap must not be too hot, nor must it be reboiled after adding the coloring, or the green will be destroyed. Mr. Betz's statement, that nothing answers so well as "the green coloring matter precipitated from a solution of indigo by lime," is, to say the least of it, very vague. The method I have given is that pursued by continental makers of green soap,¹ and works well. A Berlin-ware or Wedgewood dish may, of course, be used instead of iron or copper, but as the boiling point of the mixture is high there is great liability of fracture, and cold water must be added very cautiously, and the stirring must be almost continuous.

The proportions of oil and alkali given above are such as will turn out a satisfactory article with most samples of linseed oil, and with lye of the proper strength. I think these definite directions regarding quantities advisable for those who have not had much experience in saponification. The best guide in soap-making, where the strength of the lye is not known, is that afforded by applying a very small portion of the soap to the tip of the tongue. The sharp taste of the alkali indicates more boiling or more oil, or perhaps more water. This test, though not very scientific, is eminently practical, and is very generally employed.

The product will be about twice the weight of the oil used, and should be of a dull bottle-green color, and in consistence at least not thicker than lard or butter at moderate temperatures, just so that it will retain its form and might be carried on paper.

Genuine green soap should be made from hempseed oil, and is largely used in France (*savon vert*), Germany (*grüne Seife*) and other continental countries, where it is almost universally employed in the house-

¹ "Ure's Dictionary," vol. ii, p. 699.

hold. It is not, however, always made from this stock, but often of other vegetable and, perhaps, animal oils, and is then colored in the manner I have indicated. Under the name *Sapo Viridis* it is official in the German Pharmacopœia, but this authority does not afford any other information than that the soap is "a lubricous, soft, yellowish-green mass, of a nauseous smell." A tincture, or solution in spirit, is used in some parts of this country, but I am not aware of the exact strength.—*Canadian Pharm. Journ.*, June, 1878, p. 345.

Toronto, May 10th, 1878.

DIALYSED IRON AS AN ANTIDOTE FOR POISONING BY ARSENIOS ACID.

BY W. GIBBONS.

It has already been proposed that the solution of dialyzed iron should be used as an antidote in cases of poisoning by arsenious acid, but up to this time no one has given any proof as to the value of these suggestions.¹ The supposition was founded on the knowledge that freshly prepared peroxide of iron was the usual remedy used, as it formed with the arsenious acid held in solution in the stomach an insoluble substance, having the formula Fe_3AsO_4 . This fact was pointed out by Dr. Bunsen about forty years ago.

On hearing this I was induced to make the following experiments :

I heated $\frac{1}{4}$ liter of water in a flask to the temperature of the human body (98.4°F .) and mixed with that 7.1 cc. (f5ii about) of an acid solution containing 1 grain of As_2O_3 in the quantity taken (Liq. Arsen. Hydrochlor. B.P), to that I added 14.2 cc. of the solution of dialysed iron (strength 2 gr. in f5i) and kept this mixture at a constant temperature, *i. e.* 98.4°F ., for about one hour without obtaining any result. Now as the usual method of administering moist ferric oxide is, first to give a dose of a solution of some precipitant such as bicarbonate of soda, or a mixture of magnesia and water, followed by a large dose of the solution of perchloride of iron, I determined to follow up that method. I took all as before, but in addition I used a small quantity of a solution of bicarbonate of soda. I then found that the arsenical solution was acted upon and the desired result obtained. In the first

¹ Some experiments in this direction by Mr. Mattison, which the author appears to have overlooked, are recorded in the present volume, before.—ED. Ph. J.

case I allowed the mixture to remain together for about one minute only, and on collecting the precipitated oxide of iron and washing, I found that already it had absorbed some of the arsenious acid. A second mixture I kept together for one hour at the temperature already mentioned. I then found that about 40 per cent. of the acid was taken up. This I consider proves beyond doubt, that a dose sufficiently large of dialysed iron solution, preceded by a dose of a solution of bicarbonate of soda or of magnesia (to neutralize the acidity of the stomach, and using an excess), is an antidote in poisoning by arsenious acid.

According to Dr. Maclagan at least twelve parts of moist peroxide of iron prepared with ammonia are required for one of arsenious acid, from which we can conclude that three volumes (at least) of the dialysed iron solution (2 gr. in f5i) are required for one volume of either of the arsenical solutions of the B.P. But as yet I can give no proof as to the correctness of this statement.

Pereira says that, "moist ferric oxide is only an antidote where solutions of arsenious acid have been used, and not when the solid acid has been taken." But as the arsenic must enter into solution with the liquid contained in the stomach, it stands to reason that the antidote is as good in one case as in the other, especially as the arsenic has no action in the solid form.

In conclusion, I must add that the advantages over the ordinary method of administering the antidote are as follows:

Firstly, the solution of perchloride of iron has to be largely diluted in order to make it palatable, whereas dialysed iron does not require much water, as it can almost be taken as it is, and moreover it can be given in large doses with greater safety than ferric chloride solution.

Secondly, the amount of magnesia or alkaline carbonate in the case of dialysed iron is but small, as it has only to overcome the acidity of the stomach before acting upon the antidote, but with ferric chloride solution it is much larger, for in addition to the acidity spoken of, the alkali has to overcome the acid of the ferric chloride solution used.

And lastly, as few chemists keep moist ferric oxide ready prepared, and even if they did it would have become inactive by keeping, whilst nearly all have dialysed iron, this supplies the most rapid mode, and also the best way of administering the antidote for this most painful poison.—*Phar. Jour. and Trans.*, June 15, 1878.

VARIETIES.

A new test for carbolic acid has been proposed by Prof. E. W. Davy, of Dublin. The reagent is sulpho-molybdic acid, prepared by dissolving 1 part of molybdic acid in 10 or even in 100 parts of pure concentrated sulphuric acid, and 3 or 4 drops of this solution are added to one or two of the liquids under examination placed on white porcelain. Immediately a light yellow or yellowish-brown tint is produced, which, passing into a maroon or reddish-brown, soon develops a beautiful purple coloration, the development of which will be hastened by the application of a *gentle* heat, and which remains unchanged for a considerable time. If undiluted carbolic acid is used, the reagent will produce a dark olive, quickly changing to a very deep blue, but not to purple.

The same reagent applied to an aqueous solution of *wood tar creasote* will produce a brown or reddish-brown color, which, on standing or warming slightly, becomes fainter, passing to a light yellowish-brown. Even small quantities of carbolic acid may be detected in the creasote by dissolving 5 or 10 drops of it in half an ounce of water and distilling the solution; the first portion of the distillate will give the creasote reaction, while the purple coloration of carbolic acid will be obtained with subsequent portions of the distillate. The presence of 1 per cent. of carbolic acid in creasote may thus be detected. In the same way, the adulteration of oil of cloves¹ with carbolic acid may be recognized.—*Phar. Jour. and Trans.*, June 22, p. 1021-1023.

Undurability of Linen.—A linen manufacturer explains the reason why linen wears out much faster now than formerly, as follows: In the first place, rice starch is usually used now, which always contains caustic soda, used in its manufacture, which can be easily recognized by its peculiar salty, disagreeable, alkaline taste and its alkaline reaction on litmus paper. This, not being removed by water, but remaining in the linen, destroys it gradually. Besides the enormous weight of the flat-irons, often weighing over 20 lbs., and the additions for producing a polish, consisting of stearin, tallow, spermaceti, paraffin, etc., although of a harmless character, do their share in ruining it by forming a solid coating, the removal of which necessitates considerable otherwise unnecessary rubbing on wash-day. The author concludes in recommending the old-fashioned cooked wheat starch without any additions, stating that it will give an equal gloss without ruining the linen.—*Apoth. Ztg.*, May 11, p. 78.

Rice is of more use and of larger cultivation than any other cereal grown. It is almost the only diet of hundreds of millions of people in China, Asia, and all Eastern countries. In those countries it is used the same as potatoes, and is a substitute for them. Only at the North is rice looked upon as a luxury, to be used

¹Oil of cloves produces with Froehde's reagent a deep blood-red, afterwards a deep cherry-red coloration.—EDITOR.

with milk and sugar. At the present low price of domestic rice, it is the cheapest food obtainable, not excepting potatoes. Potatoes contain about 80 per cent. of water, and do not gain much in the process of cooking. Rice has no waste whatever, contains only 22 per cent. of water, and in boiling gains three times its original bulk. Hence, one pound of rice, at $6\frac{1}{4}$ cents per pound, makes three times as much when cooked; equal to three pounds of potatoes, at $2\frac{1}{2}$ cents per pound, or $7\frac{1}{2}$ cents. Rice properly prepared should come upon the table dry, each grain unbroken, and served with the condiments used on potatoes, and be partaken of as a vegetable, with meats, and not as a dessert.—*The Sanitarian*, June.

Camphor and Tobacco.—In an article in the "Practitioner," Dr. Edward Noakes says that in cases of over-doses of tobacco, as in the sickness from smoking, etc., a dose of camphor has repeatedly proved antidotal in his hands.—*Med. and Surg. Reporter*, June 8.

Patent-leather varnish, as we are informed by R. Hennig, consists of a quickly-drying oil (linseed-oil) and Prussian blue, and is prepared as follows: Purified old linseed-oil is heated in a copper kettle to $50-60^{\circ}\text{C}$., and treated with fuming nitric acid, which splits the palmitin existing in it into palmitic acid and glycerin. The acids are then removed by heating with oxide of lead in the proportion of 250 grams of the latter to 10 kilos of the oil, and the decanted oil is heated to 100°C ., when a saturated hot aqueous solution of permanganate of potassium is added in the proportion of 2 grams of the salt to 1 kilo of the oil. They are then heated, stirring continually, until the mixture becomes brown, when the heat is raised to 130°C . and all water is evaporated. The Prussian blue is then added through a sieve in the proportion of $\frac{3}{4}$ to 1 kilo of pure blue to every 10 kilos of oil, and the mixture is stirred and heated until a little of it spread on paper leaves a smooth, brilliant gloss. To fine varnishes finely-powdered gutta-percha is added in the proportion of 300 grams of the latter to 10 kilos of the varnish, and they are then allowed to settle for one or two weeks, when the clear, supernatant varnish is decanted.—*Chem. Centralbl.*, May 15th, p. 317.

Chrome blue is obtained by G. Bong by strongly calcining an intimate mixture of boracic acid and alumina, each 15 parts, magnesium carbonate 20 parts and chromate of barium 2 parts.—*Bull. Chim.*, 1877.

A homœopathic physician was arrested in Cologne on the charge of supplying a patient with medicine in the shape of powders contrary to the German laws, but was acquitted because it could not be proved by the prosecutor that these powders were neither simple or compound medicines, since they contained nothing but sugar of milk, according to the defendant's own statement.—*Apoth. Ztg.*, May 11th, p. 78.

Lead Poisoning.—An interesting case of lead poisoning through criminal negligence is reported from Mosbach. The patient began to suffer some years before 1876, and consulted several physicians in vain until Dr. Wittmer made a correct diagnosis, and after a treatment of over three quarters of a year entirely cured him. The poisoning was caused by imperfectly-tinned lead snuff-boxes, in which a particular brand of snuff was packed, which the patient was in the habit of buying from one and the same manufacturer, and which became contaminated with lead. A suit against the tobacco dealer was filed, who was convicted and sentenced to incarceration for eight days and payment of costs.—*Ibid.*, April 27th, p. 70.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—The Local Secretary, Mr. J. W. Rankin, has succeeded in securing excursion rates to Atlanta and return from the following points, at the figures named :

Clifton, Ont.,	\$42.75	Greensboro, N. C.,	\$17.90
Boston, Mass.,	41.75	Salisbury, N. C.,	15.55
New York,	36.25	Charlotte, N. C.,	13.35
Philadelphia,	32.75	Spartanburg, S. C.,	9.60
Baltimore,	29.15	Greenville, S. C.,	8.00
Washington, D. C.,	26.75	Athens, Ga.,	5.30
Norfolk, Va.,	32.50	Gainesville, Ga.,	2.65
Charlottesville, Va.,	25.80	St. Louis, Mo.,	33.60
Richmond, Va.,	24.65	Cincinnati, O.,	31.95
Lynchburg, Va.,	23.15	Louisville, Ky.,	26.45
Danville, Va.,	19.95	Nashville, Tenn.,	17.35
Goldsboro, N. C.,	22.95	Bristol, Tenn.,	17.00
Raleigh, N. C.,	21.25	Knoxville, Tenn.,	10.50

The fare between Galveston, Texas, and New Orleans, both ways, including berths and meals, will be \$21; the fare from New Orleans to Atlanta and return, 6 cents per mile *one way*. From other points in the Southern States a similar liberal reduction has been made, and if members and delegates who contemplate attending the meeting will communicate with the Local Secretary, Mr. Rankin will send a circular giving more detailed information in relation to the Southern railroads. The fare from Boston, we presume, is for railway all through.

In the Southern States, the tickets are procurable by the members and delegates for themselves and their families at the depots of the above cities. The visitors from north of Washington will require a printed order, endorsed by the Permanent Secretary, *for each ticket* they may need. The tickets will be sold on and after August 25th, and will be good on the return trip until September 25th. They are to be procured in New York at the office of Mr. C. Yingling, general ticket agent, No. 9 Astor House, and in Philadelphia at the Baltimore R. R. depot.

The journey from New York to Atlanta requires about thirty-nine hours, and members leaving New York on Sunday, September 1st, at 9 P. M., Philadelphia near midnight, and Baltimore on Monday at 7 A. M., will reach Atlanta, without change of cars, on Tuesday, September 3, at noon.

The delegates to the *Conference of Schools of Pharmacy* will hold their first session September 3, at 9 o'clock A. M., and should therefore reach Atlanta on Monday, September 2; they should therefore leave not later than Saturday, August 31. It is contemplated to stop over Sunday at some convenient place, probably in Virginia. The Piedmont Air Line, which will convey the Eastern party, passes through some of the most interesting portions of Virginia, North Carolina, South Carolina and Georgia, and many places along the route will afford opportunities for spending some time pleasantly and profitably. It is the intention to visit several of these localities on the return trip. The route, it will be noticed, passes through a healthy section of the South, and at a considerable distance from that portion, where Northern visitors might be liable to expose themselves to malarial influence.

The sessions will be held in the State Capital building in the Representative Hall, and the exhibition room will be near by. Arrangements have been made with the "Kimball House" to accommodate the members and their families, and first-class accommodations will be had at two dollars per day.

The Permanent Secretary will issue his special circular notice in a few days, when, it is hoped, additional information will be given. Mr. G. J. Luhn has requested us to state that all members who may pass through Charleston, S. C., on their way to Atlanta, will be welcomed by the *South Carolina Pharmaceutical Association*.

Philadelphia College of Pharmacy.—Professor R. Bridges has requested Samuel P. Sadtler, Ph.D., Professor of Chemistry in the University of Pennsylvania, to act as his assistant during the coming lecture course. Prof. Sadtler has consented, and the Board of Trustees has approved the arrangement. We understand that Prof. Sadtler will deliver a series of lectures on chemical physics to the junior class, and give his attention to the lecture experiments to be made in the course on chemistry. The illustrations, by experiments and other means, will again be considerably increased, and a number of new apparatus, etc., have been procured for the purpose

Kentucky Pharmaceutical Association.—Pursuant to resolution at the "Meeting of Organization," held in Frankfort, July, 1877, the Kentucky Pharmaceutical Association met in the council chamber, in the city of Covington, May 15, 1878, at 2.30 P. M.; the President, W. H. Averill, Esq., of Frankfort, in the chair. The President read a short address of welcome, in which he congratulated the members on having effected a permanent organization calculated to foster and develop the scientific interests of pharmacy in Kentucky. The report of the Committee on Constitution and By-Laws was received, amended and adopted,—with the provision that the by-laws be referred to a special committee, to report any change necessary

to their perfection at the next annual meeting. An election of officers was then held, and resulted as follows: W. H. Averill, Frankfort, President; Vincent Davis, Louisville, 1st Vice-President; G. A. Zwick, Covington, 2d Vice-President; M. Hermance, Covington, 3d Vice-President; W. G. White, Richmond, Recording Secretary; C. Lewis Diehl, Louisville, Corresponding Secretary; Peter Nodler, Covington, Treasurer.

The Committee on Queries reported a series of ten queries for general acceptance, and for discussion at the next annual meeting. The President, with the advice of the Executive Committee, was empowered to appoint delegates to the meeting of the American Pharmaceutical Association, in Atlanta. After the the appointment of the standing committees for the year, the Association adjourned to meet in Louisville, during the month of May, 1879; the day and hour to be named by the President.

The meeting was well attended by pharmacists representing the various sections of the State, and the two sessions held were characterized by complete harmony and singleness of purpose.

C. LEWIS DIEHL, *Corresponding Secretary.*

British Pharmaceutical Conference.—The fifteenth annual meeting will be held at Dublin, Ireland, commencing on Tuesday, August 13, at 10 A. M. The sessions will be held in the hall of the King and Queen's College of Physicians, under the presidency of Mr. Geo. F. Schacht. The general secretaries are Prof. Atfield, editor of the "Transactions," and Mr. F. Baden Benger. Dr. A. Senier is assistant secretary, Mr. Wm. Hayes local secretary, and Mr. Louis Siebold editor of the "Year-Book of Pharmacy."

After the adjournment of the conference, an excursion through the Devil's Glen to Glendalough, or the Seven Churches, is proposed, the localities being in the county of Wicklow, the scenery of which is stated not to be inferior to any in the kingdom.

Pharmaceutical Society of Paris.—Mr. Méhu presided at the meeting held June 6. A communication by M. Defresne announced the isolation of three distinct ferments from *pancreatic juice* (see p. 386); it was referred for investigation and report to a committee consisting of Messrs. Petit, Yvon and Wurtz.

Mr. Bourgoïn stated that a liter of water, at 15°C. (59°F.), would dissolve 1.25 gram of *salicylic acid*.

Mr. Cazeneuve reported on the *preparation of brucia and strychnia* from hoang nau bark; the two alkaloids are separated from each other as oxalates, brucia being precipitated at once; strychnia only at the end of 24 hours.

As a further characteristic of the alkaloid *duboisina*, Mr. Petit mentioned its behavior to polarized light, which is deviated 15.5° to the left by an aqueous solution of the alkaloid and its sulphate. Under the same conditions atropia shows no deviation.

The impurity of some commercial *iodide of potassium* was likewise referred to; some samples were stated to contain only 75 per cent. of pure iodide.

EDITORIAL DEPARTMENT.

An Apothecary's Mistake.—During the latter part of June a suit for damages has been decided at the County Court of Syracuse, N. Y., which is of considerable interest to the pharmacists of the United States. We have been favored by the *Syracuse Sunday Times* with the following fac-simile of the line, as contained in the prescription, and which we are assured is a very fair, though perhaps not absolutely perfect, representation of the original:

Sol. Atropia (2 gr 5 dr) Mach 1

The case itself, and the various questions that were involved in it, were presented at a meeting of the physicians of Syracuse, held July 7, at which Dr. Cook was called to the chair. The following report of the transactions at this meeting is taken from the *Standard*, of Syracuse, for July 8. The proceedings were opened with the following statements made by Dr. Didama:

The Case.—On the 28th of last November, Adelbert Eno came to my office for examination and treatment. He was thin in flesh, of a pale, sickly appearance; his voice was hoarse and husky; he seemed weak and debilitated. I learned that he had a chronic cough with hectic fever and night sweats. On examination I decided that the disease was chronic bronchitis, tending to and already on the border land of *phthisis*. I prescribed cod-liver oil emulsion to improve his general condition, a good noonday dose of quinine to throttle the fever which was consuming his strength and blood, and a solution of atropia with elixir vitriol to arrest the drenching night sweats. This was the form of the atropia solution:

Sol. atropia (2 gr. to oz.), drachm 1; acid. sulph. aromat, drachms 4; syrup. ad oz. 2. M. S. Teaspoonful at bed time.

The note in parenthesis was for the guidance of the druggist, Mr. Eaton. I knew that Mr. E. was a careful and intelligent pharmacist, but as there is no standard solution of atropia, I indicated the one which I am in the habit of prescribing. Some time during the following night I had an urgent call to visit Mr. Eno. Knowing that an ordinary dose of atropia could work no harm, and feeling a wicked need of rest after a hard day's work, I contented myself with sending a powder of morphine, and promised to call in the morning.

During the forenoon of the 29th I called and learned that Mr. Eno had taken about half a teaspoonful of the solution, that he had been delirious throughout the night, trying to get out of bed, coughing, complaining of burning in the throat, and the usual symptoms of an overdose of atropia. I was informed that Dr. Hubbell had been called; that he had examined the atropia solution and judged it to be some form of iron; that he gave belladonna as an antidote. I found the patient on the bed. He was rational and intelligent. He complained of a burning sensation in his throat and an inability to see distinctly. He said he was glad he did not take a full dose, if he had he believed it would have killed him. His pupils were largely dilated, pulse small and quicker than it was the day before, tongue parched and fevered, extremities cool, appearance of fatigue and exhaustion. I judged that an overdose of atropia had been taken, but I comforted the friends with the assurance that the worst was over, that no permanent mischief would result either from the dose he had taken at first or from the homœopathic belladonna solution given by Dr. Hubbell. I prescribed no antidote, for it was clear that none was needed.

and that recovery would be speedy. I visited Mr. Eaton's drug store and learned from the clerk that a solution of 2 gr. to a drachm, instead of ounce had been prepared.

Within a week I visited Mr. Eno but twice. At the second visit the effect of the atropia had passed away. There was not the slightest dilation of the pupil, and there were no symptoms properly referable to the overdose he had taken. I learned that Mr. Eaton had prepared a new solution of the strength first ordered, and that a dose had been taken, with somewhat unpleasant effects. The night sweats still persisting, I ordered pills of oxide of zinc, which were effectual. During the months of December and January I made a very few visits, and I judged that the patient was making fair progress—not in recovery from atropia, for there was nothing which indicated that he had taken this drug—but in his bronchial difficulty, which had threatened to end—and which may yet end—in consumption.

Somewhere near the close of January I received notice that the patient had concluded to call in Dr. Whedon, and I learned about the same time that negotiations for a settlement with Eaton had failed. There was nothing that indicated to me the presence of chronic or other inflammation of the stomach. Digestion was impaired, and so it was before the atropia had been taken. Vomiting may have been a symptom, but it usually accompanies pulmonary troubles, which are attended with a severe cough and hectic fever. Weakness was present, and the patient was ordered to keep quiet; not because of atropia, but because the consuming disease was still progressing and because exercise was thought to be hurtful.

I have no doubt that Mr. Eno took the half dose, equal to one-sixteenth of a grain, as stated by Mrs. Eno and commented on by Mr. Eno.

I have no doubt that this dose produced the symptoms described by Miss Eno, a lady of unimpeachable veracity.

I have no doubt that the effects of this considerably large dose rapidly subsided, and that within a week the patient was as if he had not taken atropia at all.

I have no doubt that but for the meddlesome interference of third parties, who hoped to make money out of the transaction, Mr. Eno would not have dreamed of instituting a suit.

How far a vivid imagination stimulated to unusual activity by the hope of gain, dexterously held out by the tempter, influenced the judgment and instigated the testimony of Mr. Eno, I leave others to judge. That a monstrous injustice has been perpetrated—that a cruel penalty has been inflicted on a careful and estimable druggist—that every physician and pharmacist is at the mercy of tramps and black-mailers, will, I trust, be evident before the close of this discussion. I propose to give a mere outline of points to be discussed, leaving to abler colleagues the filling in and elaborations.

Written Prescriptions.—Old signs and their ambiguity. The symbols for drachm and ounce resemble each other closely, and are not unfrequently confounded. For several years I have not used these symbols. I have written oz. for ounce and drachm in full. I have ceased to employ the Roman numerals, such as VIII for eight and LXVIII for sixty-eight. I have dropped the larger O as an abbreviation signifying pint, and have omitted the unnecessary symbol meaning scruple. I have tried to use words and abbreviations which were free from ambiguity, and I have reason to know that my practice has received the endorsement of not a few eminent and progressive members of the profession. And it is a source of no small mortification to me that a prescription of mine could have been misread and construed in a manner different from my intentions. Had I used the antiquated and obsolescent symbols instead of oz. and drach., I could not have wondered at the mistake which was made. I shall not return to the use of the awkward and delusive symbols. I may use the word *uncia* for ounce, or I may discard Latin entirely and employ the metric system. Latin is the universal language. Prescriptions written in it can be put up, as I have reason to know, anywhere in Europe. The metric system is not

yet thoroughly introduced nor understood. Pharmacists are bound to know the dose of poisonous drugs which they dispense.

In case of doubt or ambiguity of prescriptions, they must consult the authorities. The highest authority known to the pharmacist is the Pharmacopœia, or the Dispensatory, which is a commentary on the Pharmacopœia. If the Dispensatory authorizes a wrong dose, the physician who prescribes and the pharmacist who prepares it should not be charged with negligence.

Now, let us suppose that Mr. Eaton suspected that one-eighth of a grain of atropia was a large dose. He opens his medical bible—the last edition of the U. S. Dispensatory. He reads that a commencing dose is 1-15 of a grain,¹ and that this amount may be safely increased. The amount which seems to be ordered in the prescription is not twice the quantity which is indicated in the book as a commencing dose. If 1-15 is a safe commencing dose 1-8 cannot be extravagantly large, while 1-64 is too small to be of any service. So he reasons, and puts up the prescription. It is plain enough to you and me that the Dispensatory has made a mistake. Our knowledge has been drawn from a variety of sources. But is the pharmacist bound to be wise above what is written, and is he to be punished for the mistakes of the U. S. Dispensatory? Remember that Mr. Eno took less than the quantity sanctioned by the highest medical authority, and then judge if it was not a hard ruling that demanded of the studious druggist a wisdom superior to that of the book which he has been led to regard as unquestionable and unerring.

Effects of Atropia.—Atropia, as is well-known, is the active principle of belladonna and stramonium. In moderate doses, it is a safe and invaluable medicine. In overdoses, it produces temporary mental and physical derangements; it causes transient delirium and paralysis, as alcohol does, but it is speedily eliminated by the kidneys and other organs. It does not produce any characteristic organic lesion; and so, when it is eliminated, its effects cease. One of its earliest manifestations is a dilation of the pupil of the eye, and this dilation is the last symptom to disappear. When the pupil acts normally, it is safe to conclude that no portion of the drug remains, and that its effects have all ceased. The older observers mentioned inflammation of the stomach and intestines as a *post mortem* appearance. Now, if this inflammation were produced by the drug, in cases where the dose is not fatal, it would speedily subside without treatment, and would not remain after the elimination of the drug. The vomiting is no sign that inflammation is present. All the symptoms, the dryness of throat, the vomiting, the dilation of pupil are produced when the drug is injected into the arm, and when no portion comes directly into contact with the stomach. But late and careful examination finds no trace of gastric inflammation even in the fatal cases. Of course, then it does not exist in the cases which are not fatal.

The learned counsel asked me to name one authority which declares that inflammation is not found in the stomach after death. I could not do it. Neither could I have named one authority which states that atropia does not produce warts on the hands nor corns on the feet. The authorities tell what is found. They give minutely every *post mortem* appearance. And when H. C. Wood and Von Bœck, the latest authorities, make no mention of inflammation of the stomach, it is safe to conclude that inflammation is not produced by atropia. In regard to the permanent influence of the drug on the nervous system, there is the single statement of Dr. Garrod, that belladonna produced nervous depression in his case for two years, against the testimony of hundreds that the effects of atropia are very transitory. Dr. Garrod was honest, and he had no pecuniary temptation to lie or to exaggerate. No pettifogger of the baser sort had nagged and coaxed him to commence a suit for damages against his friend. No contract had been entered into with him that the impecunious pettifogger would pay the costs if the verdict were adverse, while a

¹ This refers to a typographical error on page 1090 of the fourteenth edition of the U. S. Dispensatory, "One-fifteenth" should be corrected to *one-fiftieth* of a grain.—EDITOR AM. JOUR. PHARM.

"wack-up" should be demanded only in case of a satisfactory and bounteous decision.

Dr. Garrod told what he believed to be the truth; but it is not at all improbable that the indistinct "nervous depression" may have been to a great degree imaginary or the result of causes other than belladonna. Belladonna contains active principles in addition to atropia, and these may have had an influence. At any rate, the experience of Dr. Garrod is unique; and neither physicians nor druggists should be held responsible for exceptional effects, so rare as to be almost incredible.

The Law, the Object and the Interpretation.—The Code of 1876 and 1877 provides: "A person duly authorized to practice physic or surgery shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity." And the Court of Appeals holds that any information, however acquired, which is necessary for a physician to prescribe for his patient is excluded. Judge Miller stated that such exclusion is necessary for the safety of the patient. Let us look for a moment at this monstrous enactment. Any person "duly authorized" to practice physics and surgery cannot reveal the condition of his patient even to protect the greatest fraud. But a person *not* duly authorized, a person not having a diploma, or having, as is sometimes the case, a forged diploma, can disclose any information which he chooses. The reputable physician, who knows all the facts in the case, must stand by with folded hands, and see an unscrupulous patient fleece his victim, while the charlatan, expelled from society for having spurious credentials, is permitted to give his base assistance to the side which offers the greatest recompense.

I take it that the law was intended to prevent revelations affecting the personal honor or the delicacy of the patient. It was unnecessary, so far as anyone worthy of a place in the profession is concerned, for the secrets of the medical confessional can never be extorted from the honorable physician. But there are worthless scoundrels who creep into every profession, and they must be restrained from blurring out unpleasant facts which have been communicated in confidence. Hence the necessity for some law. But this law shuts the mouths of those who would never open them to betray, while it authorizes the outcasts of the profession to divulge secrets dearer than life, or to demand blackmail as the price of concealment. It could never have been the intention of decent legislators to prevent a physician from contradicting a patient as to the effect which a certain drug produced. A nervous, hypochondriacal patient might exaggerate his symptoms; an unscrupulous one, under the goading of a fanished legal barnacle, might not only exaggerate existing symptoms, but feign a multitude of new ones; and the attending physician is the only person in the world who can rightly weigh the real and detect the fraudulent. It is monstrous injustice to admit the testimony of the interested fraud and exclude evidence that would reveal the imposition. It is well enough to forbid the revelation of disgraceful or ridiculous secrets, but the present enactment with its temptations to fraud, and its special license to the worst scapegraces in the world, is a hideous travesty of justice—a connivance at blackmailing—a monstrous blot on the statute-book of the Empire State. *It should be repealed.* I need not waste time in pointing out the inconsistent and unequal application of the law in the present case. I was forbidden by the Judge to testify as to the condition of Eno, yet I alone knew how the drug had not affected the patient. But Drs. Hubbell and Whedon were permitted to divulge all the information which they had obtained from Eno when he was their patient; and their testimony had undoubted weight in securing for the plaintiff the verdict of exorbitant charges.

The Effect on the Druggist.—That Eaton misread a reasonably plain description was established to the satisfaction of the jury. The damages assessed were simply enormous. But there need be no apprehension felt as the effect on the young man's business. His dearly bought experience will last him a life time. Henceforth there will be no such word as mistake with him. Every article in every prescription will be scrutinized with a care hitherto unknown to the craft. Public confi-

dence will be reposed because confidence has now a sure foundation, and troops of friends will hasten to express practical sympathy with one so outrageously fleeced.

Conclusion.—It is no part of my purpose to cast reproach upon the court, or to inveigh against the lawyers. The fairness and uprightness of the learned Judge needs no endorsement of mine. The shrewdness and ability of the counsel are known to all men. Whether it would not have been wise and well for the Judge to have ruled that the law was never intended to be used, as in this case, to perpetrate injustice—and that it should not be so used—is a question for him. Whether a lawyer cannot be smart, and at the same time a gentleman, is a question purely of taste. As medical men and good citizens it is our duty to labor for the repeal of a law which rewards ignorance with special privileges, which affords ample facilities for fraud and extortion, and which shamelessly muzzles every witness whose testimony would uphold the right and trample down the wrong.

Dr. Benedict spoke of sharks outside of the legal profession. He gave a description of the marine shark, and drew a parallel picture of the land shark. His remarks were by turns humorous and sarcastic. He related instances where human pilot-fishes secured medical prey for the too willing sharks. He paid a high compliment to the skill and integrity of Mr. Eaton. He stated that atropia and all the vegetable neurotics are evanescent in their effects. He doubted not that but for the efforts of the pilot-fish, Eno would never have attempted the consumption of Eaton. He paid a glowing tribute to the work and disinterestedness of the medical profession, and appealed to the doctors not to act as pilot-fish to sharks of any kind.

Dr. R. F. Stevens expressed his belief that a great wrong has been done by the recent verdict, wrong to the druggists and public generally. He thought it was an outrage to exclude competent testimony and admit that of those who are not authorized to practice. Druggists and physicians are in peril if this law is to be enforced.

Dr. Dunlap briefly remarked that it was well known that the effects of belladonna were transitory.

Dr. Doane wished the medical profession could expel all the sharks. He could see no reason why a man suffering from intoxication produced by atropia should make any more fuss than if he were drunk from alcohol. He thought that the verdict was obtained by the exclusion of evidence. He approved the writing out of drachms and ounces instead of using symbols. If the man did not suffer any permanent wrong, why should he be paid for it. Hundreds and thousands of persons have been poisoned temporarily by belladonna. The effects are never permanent.

Dr. Hawley judged from what he had heard that the druggist had been wronged, although he had made a mistake. He endorsed Dr. Benedict's eulogy of the medical profession and denunciation of sharks.

Dr. S. H. Moore commented on the duties of druggists and physician. He reflected severely on Drs. Didama and Benedict.

Dr. W. Manlius Smith said that one-eighth of a grain of atropia is an inconvenient but never a fatal dose. Atropia is anti-inflammatory instead of inflammatory. The early cases which seemed to show inflammation of stomach were produced by the staining of the berries. No recent authority speaks of inflammation of the stomach as the result of atropia. Regarding paralysis, Von Bœck says, that the tossing about of the patient shows he is not paralyzed; that afterwards there is

nothing but a want of co-ordinating power in the muscles from loss of sensation. Paralysis, if it occur, does not happen till near death. The so-called spasms were not convulsions but paroxysms of tossing about.

Dr. Cook, the chairman, called upon Mr. Fuller, who was present, to make remarks.

Mr. Fuller animadverted upon the law which permits fraud, if the recent decision is to be sustained. He judged that the shutting out of the testimony of the physician in attendance was not intended by the legislature, and was an outrage. The law should be such that it will be an easy matter to unearth and punish fraud.

The chairman closed the discussion with a statement of some of the jurors that the substantial agreement of the doctors in their testimony was very suspicious. He complimented druggists on the care usually taken to prevent mistakes.

We make also the following extracts from Judge Riegel's charge to the jury :

It appears that a dose of this preparation was administered to the plaintiff on the evening before Thanksgiving; that soon thereafter he was seized with violent spasms, his throat became dry, he felt a burning sensation in his throat and stomach, was seized with retching and vomiting, and tossed himself to and fro upon the bed, and the pupils of his eyes were dilated. His family became alarmed and sent for his relatives. After three o'clock he became easier. The immediate symptoms of the poison passed off within a few days, but it is claimed by the plaintiff that it produced effects more or less permanent. It is claimed that by reason of this poisonous dose he was rendered so feeble as to be compelled to remain indoors until the following April, during nearly all that time keeping his bed; that for a considerable space of time thereafter his sight was impaired so as to be unable to read at times; that the poison produced inflammation of the stomach, which caused frequent vomiting and loss of appetite for a considerable space of time; that his lower extremities are still partially paralyzed; that he has not wholly recovered from these effects of the poisonous dose.

It is conceded by the defendant that the immediate symptoms which are claimed to have followed the administration of this dose did and would naturally follow, but the permanent results which are claimed to have followed it are denied, and physicians have been placed upon the stand to prove that by the known nature of this poison, those results did not and could not have followed.

It being conceded that some evil consequences to the plaintiff did follow the administration of the poisonous dose, the extent of those evil consequences can only be material as bearing upon the amount of damages that should be awarded to the plaintiff in case the jury shall find the defendant liable. I will, therefore, call the attention of the jury first to the question of liability, and then to the question of damage.

The action is for negligence. It proceeds upon the theory that a man who follows the calling of a druggist holds himself out to the community as possessing the amount of skill, caution and prudence which a man exercising so responsible a calling ought to possess. The greater the danger to the public from want of skill, want of care and want of prudence in the conduct of any trade or calling, the greater the duty resting upon the person carrying on that trade or calling, that he possess and exercise that skill and prudence. There can be no doubt that it is the duty of every man who holds himself out to the community as a druggist, a compounder of drugs and medicines, many of which are deadly poisons, and when improperly administered dangerous to life and health, is in duty bound, first to possess himself of a competent knowledge of the nature and qualities of these drugs so as to know at a glance whether the dose as prescribed is dangerous—and that he cannot shelter himself from the consequences of ignorance in these regards behind the written prescription of a physician, however eminent.

A number of witnesses testify they should read the so-called *ambiguous characters* in the written prescription of Dr. Didama as standing for ounce. A number of other witnesses testify they should read them as standing for drachm. All the physicians swear that the dose as put up would be very unusual as a medicine, and it appears the plaintiff procured the medicine of the defendant in person, and informed him whom and what it was for.

It appears that atropia is the active principle of a vegetable poison called belladonna, and that in large doses it is fatal to human life.

Now, gentlemen, looking at this written prescription with the so-called ambiguous characters and the context, just as it is; looking at the fact that the defendant knew that this was a first prescription of Dr. Didama's for the defendant, as a remedy for the complaint from which he was suffering; looking at the character of this drug; looking at the degree of skill the defendant ought to possess in view of his responsible calling, did the defendant possess and exercise that degree of skill, care and prudence in reading this prescription and in compounding this medicine which a man of competent skill and extraordinary caution, care and prudence would have used under like circumstances? If he did, then he performed his full duty and no blame can be attached to him, and the action must fall to the ground. It is a case of pure accident which always have happened and always will without any blame attaching to any one. If he did not, and the evil consequences which ensued are the result of a want of such skill, care and prudence in compounding this medicine, then he is liable.

If you find that he is liable, then you will proceed to the question of damage. As before stated, it is conceded that the symptoms which are claimed to have followed immediately upon the administration of this drug did happen, and, therefore, the jury will have no hesitancy in giving the plaintiff such damages as will fairly compensate him for the suffering, pain and distress of mind and body which were the immediate result of the poisonous dose, and the only question for your further consideration will be whether the more or less permanent results which are claimed to have flowed from this poisonous dose, such as inflammation of the stomach, vomiting and partial blindness at times, and partial paralysis of the lower extremities, did in point of fact take place, and if so, whether they are to be attributed to this poisonous dose. On this subject Dr. Moore, a witness for the plaintiff, testified: "It *might* produce lasting results,—from an eighth of a grain I should expect a result continuing from three or four weeks up to a year."

Dr. D. Wheden testified that he treated the plaintiff some time after the poisonous dose was given. "I formed the opinion that something had caused an acute inflammation of the stomach. Poisons are very liable to cause such inflammations. I think an eighth of a grain would be sufficient to account for it. A variety of causes might have produced it."

Dr. William C. Doane, a witness for the plaintiff, testified—"It is regarded as an evanescent poison; we expect no permanent results; I should expect that if a man did not die of belladonna he would recover perfectly. I think all authors agree in this; I would not ascribe inflammation of the stomach to the action of atropia.

All the scientific witnesses sworn on the part of the defendant, including Dr. William Plant, Dr. William Munius Smith, physician, surgeon and chemist, Dr. Pease and Dr. Didama, substantially agree with Dr. Doane that it is an evanescent poison, and that they would not expect any permanent results.

Dr. Didama testified that what is said in Beck's Medical Jurisprudence about the appearance of inflammation of the stomach, upon a *post mortem* examination after death, by this drug, had been corrected by late writers. These witnesses are of the opinion that poison from atropia is analogous to poison from alcohol, when a man becomes intoxicated. When he becomes sober, he is as well as before. There are no permanent results. It is to be borne in mind that the medical books are not evidence of themselves, except in so far as their statements are borne out by the medical witnesses. It is for the jury to find upon this state of evidence whether,

what are called the more or less permanent results, which are claimed to have been caused by the poisonous dose, are justly attributed thereto or not, and award damages to the plaintiff accordingly.

The plaintiff is not entitled to exemplary damages in a case like this. He is only entitled to such damages as in the sound judgment of the jury shall be a just compensation to the plaintiff for his actual sufferings of body and mind, resulting from the poisonous dose. He is entitled to actual compensatory damages.

There is no evidence of a wilful wrong or of a reckless disregard of duty for which you are at liberty to award damages as a punishment to the defendant. But the damages should be strictly compensatory. Take the case, gentlemen, and decide it according to the evidence.

The jury brought in a verdict for the plaintiff in \$450. A request by the defendant's counsel for a new trial was denied by the court; but permission was granted to make and prepare a case of exceptions after entry of judgment.

In presenting this case to the notice of our readers it is not our purpose to discuss the physiological effects of a large dose of atropia; we must leave that to the medical experts. But we desire to direct attention to the commendable position taken by the leading physicians of Syracuse to shield the apothecary who had committed the mistake—not from the legal consequences of his error—but from the imposition of damages largely in excess over those allowed by the law as defined by the learned judge.

Another curious feature and evident injustice, though committed according to the letter of the law, is the exclusion of medical evidence on the part of the attending physician, while laymen and others were by the ruling permitted to testify in regard to effects, which, it must be supposed, could not be interpreted better than by the physician who attended the patient for two months after he had taken the large dose of atropia.

It is very evident that in many parts of the United States the laws referring to liability for negligence or error of judgment, and to expert testimony, are very much in need of being amended.



Pharmaceutical Legislation in the District of Columbia.—A pharmacy law has been passed by Congress, and was approved June 15th, for the regulation of the practice of pharmacy in the District of Columbia, which provides for the appointment of five commissioners, three of whom shall be pharmacists and two physicians. All pharmacists, in business on their own account, and all assistant pharmacists of the district, who prior to the passage of the act, have been engaged in prescription stores, are to be registered, within sixty days, as *registered pharmacists*; all others are to be examined, after having attained the age of 21 years and served in prescription stores not less than four years, or are graduates of some respectable medical school or university, the examination fee being ten dollars. Graduates in pharmacy, of a college of pharmacy that requires a practical experience of not less than four years before granting a diploma, are registered without examination, the fee being three dollars. Rejected candidates may be examined again at the expiration of twelve months without additional charge. Registered pharmacists are responsible for the quality of all medicines, except those sold in original packages; adulterations are subject to a fine of one hundred dollars, and in addition thereto

the name of the person is stricken from the register. Poisons are to be properly labeled, and sold only to persons who are aware of their poisonous character; the sale of poisonous alkaloids, arsenic and others is to be duly registered. Violations are liable to a fine of from twenty-five to one hundred dollars. Itinerant vendors of drugs, nostrums, and medical or surgical appliances, or those, who by printing or any other method publicly profess to cure or treat diseases, etc., are required to pay an annual license of two hundred dollars.

The Commissioners for the next two years are Messrs. W. S. Thompson, Chas. Becker and J. D. O'Donnell, and Drs. J. C. Riley and J. E. Morgan.

The Cinchona Alkaloids.—Dr. O. Hesse, the author of the interesting paper on the subject of which we have given an abstract in the June number, pp. 299–304, has directed our attention to an error which we omitted to correct. In the note on p. 300, Pasteur's "quinidia," should read "cinchonidia," which our readers will please correct. On various occasions since 1869 ("Am. Jour. Phar.," 1869, p. 421), when, we believe, Hesse first proposed the name *conquinia* (conchinin), we have informed our readers that Hesse continues its use, and we may state that it is also employed in the essay above referred to, as it appeared originally in *Berichte d. d. chem. Ges.* Hesse strongly advocates its general adoption, to avoid the confusion resulting from the use of the term quinidia (chinidin) for two entirely distinct alkaloids. In Great Britain and the United States, however, Hesse's *conquinia* is, we believe, invariably designated as *quinidia*.

Berberis repens.—After the paper on p. 373 had been printed we had occasion to examine Lindley's figure of this plant (Botanical Register, plate 1176) which is entirely different from the one given on p. 374. The leaves of the former are nearly orbicular in outline, and have the lowest pair of the leaflets very near the base of the petiole. The leaflets of our plate agree in many respects with Gray's description for *B. aquifolium*; they are, however, not in the least acuminate. It is very likely that the different species may vary to some extent in the characters of their leaves, and we trust that our friends in California and Oregon will enlighten us on this point.

Correction.—On page 323, note 1, line 6, "100 grams" should read 10 grams Epsom salt.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Fownes' Manual of Chemistry, Theoretical and Practical. Revised and corrected by Henry Watts, B A, F.R.S., etc. A new American from the twelfth English edition. Edited by Robert Bridges, M.D., Professor of Chemistry in the Philadelphia College of Pharmacy. With 177 illustrations. Philadelphia: Henry C. Lea, 1878. 12mo, pp. 1027.

"Fownes' Chemistry" has been for so long a time in the hands of both teachers and students that its merits are well understood and appreciated, and need no further

commendation; and since the present editors of the English as well as of the American edition have acted in that capacity on several previous editions of the same work, they must certainly be regarded as familiar with the wants of those for whom Fownes has been a welcome guide and a reliable authority for consultation. It would seem, therefore, unnecessary to enlarge upon the merits of the work; and when we state that, in our opinion, the present edition in every respect sustains the high reputation which its predecessors have acquired and enjoyed, we express therewith our full belief in its intrinsic value as a text-book and work of reference. We propose merely to briefly notice the changes and to give a very condensed outline of the arrangement of the present edition.

The additions of new matter have been so considerable that it was found advisable in England to issue the work in two volumes, which in the American edition have been compressed into one, through the use of a small but very clear type. It has been found necessary to omit that portion of the previous editions which related to physiological chemistry, including the description of the tissues and fluids of the animal body, and the functions of nutrition and respiration; this necessity will doubtless be regretted by some, but this department of chemistry has become so extensive as to require treatment in separate works.

As heretofore, the manual, after a brief introduction, opens with chemical physics, followed by the chemistry of the non-metallic elements, chemical philosophy, and the chemistry of the metallic elements. The chemistry of the carbon compounds, as might be expected, occupies the greater half of the work. After an introduction embracing special theoretical considerations, the compounds are classified as follows:

The fatty group is divided into hydrocarbons (paraffins, olefin, ethin, etc.) and their immediate derivatives; alcohols and ethers (comprising among the triatomic alcohols glycerin, and among the hexatomic alcohols mannit, the sugars and other carbohydrates); amines, aldehyds, ketones, acids and amides. The other groups are the aromatic group or benzene derivatives (subdivided similar to the preceding; the indigo group; diphenyl group; naphthalene group, and anthracene group. These are followed by the terpenes and camphors, glucosides, bitter principles, coloring matters, alkaloids, pectous substances, bile constituents, gelatinous substances, proteids and brain constituents. An appendix contains a number of valuable tables.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By Robt. Bentley, F.L.S., etc., and Henry Trimen, M.B., F.L.S., etc. Philadelphia: Lindsay & Blakiston, 1878. Price, each part, \$2.00.

Parts 29 and 30 contain *Amomum melegueta*, *Rosc.*; *Cassia marilandica*, *Lin.*; *Cinnamomum camphora*, *Nees*; *Erigeron heterophyllum*, *Mühl.*; *Ferula narthex*, *Boiss.* (asafœtida of Thibet); *Garcinia Hanburii*, *Hook.* (gamboge); *Guaiaecum officinale*, *Lin.*; *Indigofera tinctoria*, *Lin.*; *Juniperus sabina*, *Lin.*; *Pistacia lentiscus*, *Lin.* (mastic); *Pist. terebinthus*, *Lin.* (Chian turpentine); *Sassafras officinale*, *Lin.*; *Styrax benzoin*, *Dryander*, and *Tylophora asthmatica*, *W. and Arn.* (Indian ipecacuanha).

La vanille à la Réunion. Par A. Delteil. Montpellier: Firmin et Cabirou, 1878. 4to, pp. 52.

This is a thesis presented by the author to the Ecole supérieure de Pharmacie de Montpellier, for obtaining the degree of Pharmacien de 1re classe, and treats of the history and botanical relations of vanilla; its culture; the preparation of the fruit; the chemistry of vanilla; its diseases, falsifications, properties and uses, and finally of the pharmacy of vanilla.

This is followed by a short notice of *saham*, *Angræcum fragrans*, *Dupetit-Thouars*, the leaves and fruit of which contain coumarin. An appendix contains meteorological observations made at the island of Réunion (Bourbon) during the years 1876-77.

As director of the agronomic station of that island, the author enjoyed special facilities for investigating the subject of his thesis.

Kinologische Studiën. Door Dr. J. E. De Vrij.

We are indebted to the author for Nos. 31, 32 and 33 of his "quinological studies," which are reprinted from "Nieuw Tijdschrift voor de Pharmacie in Nederland," and treat of *quinamina*, one of the constituents of East Indian bark of *Cinch. succirubra*; of *quinetum*, the crude mixed alkaloids as obtained from Indian *cinchona*; and of *Cinch. Hasskarliana*.

We acknowledge the receipt of the following pamphlets:

An Outside View of Pharmacy. By Rev. J. M. Manning, D.D. Address delivered at the Third Annual Commencement (1871) of the Massachusetts College of Pharmacy.

The Pith of the Dried Corn Stalk as a Uterine Tent, and General Remarks upon the Use of Uterine Tents in Gynecological Practice. By W. T. Goldsmith, M.D., Atlanta. From the "Transactions of the Medical Association of Georgia."

Neuralgia and its Modern Therapeusis. By Jas. B. Baird, M.D., Atlanta. From the same publication.

Amputations and Excisions of the Cervix Uteri; their Indications and Methods. By J. Byrne, M.D., Brooklyn, N. Y. From Vol. II of "Gynecological Transactions," 1878.

Annual Report of the Commissioners of Fairmount Park. Philadelphia, 1878. Pp. 154. Handsomely illustrated.

OBITUARY.

F. J. MALAGUTI died in May, aged 75 years. He was formerly one of the chemists of the porcelain factory at Sèvres and afterwards professor of chemistry at Rennes and rector of the academy in that city. The deceased was well known for his careful and thorough investigations, chiefly in organic chemistry. Several of his papers, of special interest to pharmacists, were published in the earlier volumes of this journal.

THE AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1878.

ON AN EFFICIENT DRUG PRESS.

BY CHAS. T. GEORGE, Harrisburg.

Read at the meeting of the Penn'a Pharmaceutical Association, Reading, June 11.

The drug press is an important piece of machinery for every well-regulated drug store, and should combine the following qualifications in order to make it a success.

First. Great power, easily applied.

Second. Cleanliness during operation, and easily cleaned after being used.

Third. It should be applicable for all manner of pressing: oils, alcoholic and water preparations, as well as fruit juices.

Fourth. Simplicity of structure, in order to insure cheapness of repair in case of breakage.

The most powerful press that suggests itself to our consideration is the hydraulic or Bramah press; this, however, has many qualities calculated to interfere with its usefulness in a retail drug store. 1st. Its complicated machinery and expense. 2d. On account of the liquids used in the production of power; if water is used, it is apt to freeze in winter, and thus disable the press; should oil or glycerin be used instead of water, it will add materially to the cost as well as increase its filthiness.

The next press that presents itself for inspection is the single screw press, where the screw descends perpendicularly upon a horizontal block, moving within a perforated vessel; this surrounded by a vessel not perforated, but having a spout or outlet for the expressed liquid at the bottom. This press is much in use, and deservedly so, on account of simplicity of structure and cheapness; and where great power is not required, as in the simple expression of tinctures, it is all that could be desired. The objections are: 1st. That great power cannot be

applied to a single-screw press without making the horizontal block raise or cant along the side, thus making the pressure uneven and partial or filling the perforations and preventing the flow of the expressed liquids; neither can it be used for expressing oil or fatty substances, on account of the difficulty of applying heat. It is also troublesome to clean, as every part of the press must necessarily be soiled by the drug or liquid.

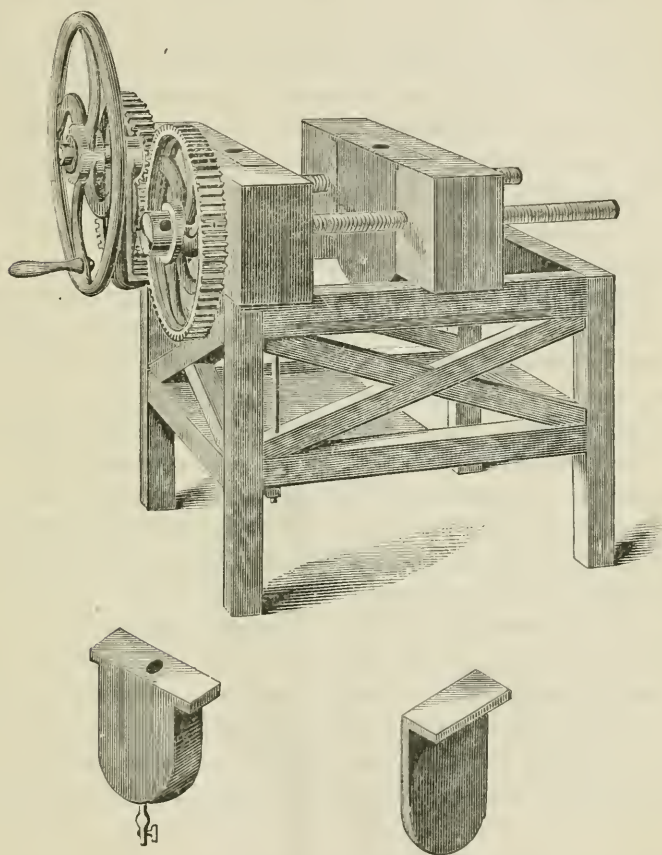
The press known as Friedrich Mohr's horizontal double screw press seems, to my mind, better adapted to the wants of pharmacy than those previously described, 1st, because canting or uneven pressure is impossible, the sack containing the drug being placed between the two screws; 2d, because it is easy of access, being open on all sides; 3d, because it is useful for expressing everything but oils; 4th, because it is easily cleaned, easily repaired, and cheap. However, it is not unobjectionable, 1st, because great power cannot be attained with the short lever handles attached to the nuts, which alone are movable, the screws being stationary in the movable horizontal block; 2d, because there is always great danger of bending or breaking the screws because only one screw can be turned at a time, and by carelessly drawing one tighter than the other injury must result to the press; 3d, because the press, if carefully operated, is very slow and tedious in its results; 4th, because it is not adapted to the expression of oils unless by the use of metallic saddle plates, which could be heated and hung upon the horizontal blocks, the drug for expression resting between the heated saddle shaped plates. This, however, would only insure partial success, as the heat must always be very irregular in temperature and, of course, rapidly dissipated, when it would be necessary to remove the cold plates and replace them with heated ones, occasioning much labor, with trifling results.

Having often experienced the wants of a good substantial drug press, and being unable to purchase one that approached my idea of a perfect druggists' press, I had one made, which has proved satisfactory in every way, and which I will now try to describe.

The first part consists of a strong and substantial framework, made of ashwood, $2\frac{1}{2}$ inches square, 32 inches long, 26 inches wide and 25 inches high, forming the base or table, upon which the press moves.

The second part consists of two pieces of timber, resting upon this frame, each of which is 28 inches in length, 9 inches high and 6 inches

wide, one firmly attached by iron rod and keepers to one end of the frame or table, and the other one free or movable, both blocks at same distance from end being bored with smooth holes to receive the two iron screws.



Upon the movable block, and opposite the holes, a female nut of bell-metal is firmly fixed. Upon the inner face of these two timber blocks an iron casting, saddle-shaped and hollow, is inserted, flush or even with the face of the block, the height and width of which is 12 inches and the diameter 3 inches; the thickness of the iron crust being $\frac{3}{4}$ inch, leaves a cavity of $1\frac{1}{2}$ inch in diameter, or capable of holding 6 pints of boiling water each, each casting having a hole on top to receive

hot water or steam, and to discharge the chilled water at bottom a brass pet-cock is fixed.

The two iron screws are 32 inches long and 2 inches in diameter, and of course pass through the holes of both blocks of timber; the head of each screw has an iron cog-wheel, 16 inches in diameter, attached; into the cogs of both wheels a 4-inch pinion-wheel is neatly and firmly fixed, which in turn is fastened to a short shaft having at its end an iron fly or lever-wheel, 22 inches in diameter, with handle.

By the turning of this wheel both screws are evenly and rapidly turned, without danger of bending or breaking, and consequently one block drawn surely and with great power against the other, thus expressing whatever drug may be placed, in a sack of strong linen toweling, between the two blocks of timber.

The power is great enough to express three ounces of oil from one pound of linseed meal, provided the castings are filled with boiling water, and without any great muscular effort on the part of the operator.

Two saddle-shaped poplar boards are used to cover the iron castings when wanted to express other than oily or fatty preparations.

On account of simplicity of structure, cheapness, cleanliness and great power, I think this press will commend itself to every druggist in the land who takes pride in his profession and labors for the public good. With it he can produce all manner of expressed oils, oils and ointments by decoction economically expressed, tinctures, fluid extracts and fruit juices.

In conclusion, I wish to state that a sketch of the press accompanies the description; and, furthermore, that no patent has been applied for, and that any one is at liberty to make use of my very limited experience in press building and the use of the press in pharmacy.

THE MICROSCOPE.

BY HANS M. WIJDER.

Considering the growing importance of the microscope for the pharmacist (an importance which dates not from yesterday), it is a curious fact that in all the forty-nine volumes of the "American Journal of Pharmacy" no mention has been made of the desirability, if not for every pharmacist, at least for every apothecary, of possessing such an instrument. Only a passing notice is found in vol. xxv (1853), p. 45.

Although only a mere beginner in microscopy, I take the liberty of calling the attention of my colleagues to this instrument, and of suggesting that some instruction in the use of it be provided by the different pharmaceutical colleges, in conformity with the usages of most medical colleges; attention to said instruction of course not being obligatory at first.

Two ideas seem to have deterred most pharmacists from buying a microscope: That it is difficult to use, and that it is very expensive.

1. The mere handling of the microscope (which is little more than taking proper care of the instrument and of one's eyes) is learned easily enough; the intelligent use of the different parts and accessories is only learned by practice; under guidance, if attainable. There is, however, this advantage with the microscope: it is never tedious, always interesting, and with increasing familiarity with its use grows more so. Before one has had it two weeks its usefulness will be felt.

2. As to its expensiveness—well, yes, that is true—neither five, nor ten, nor fifteen dollars will buy an instrument worthy of the name. A serviceable *working* microscope can not be had for less than thirty-five or forty dollars, including the most necessary accessories; as necessity demands and circumstances permit, additional apparatus may be fitted at any time and without trouble.

Illustrated catalogues may be obtained from most opticians for a return stamp, and will convey better information as to price, etc., than can conveniently be given here. The first-class microscopes cost from \$1,400 down to \$2—300, and contain more apparatus than the average pharmacist is likely to use or even to understand, hence they are out of the question. The second-class (student's, professional, physician's), \$60—100 or more, will satisfy the most exacting of our profession. The third-class (educational, economical), \$35—50, will perhaps suit the purposes of most pharmacists.

The binocular microscope is of such general usefulness that it should be preferred where its price is not a positive objection (not under \$100). Foreign microscopes are, as a rule, cheaper, but with an import duty of 40 per cent. and other expenses they will cost as much, if not more, than American instruments.

I would strongly recommend to get "Phin, practical hints on the use of the microscope." This little book restricts itself to its subject and

contains all the advice that can be given on paper, being one of the best substitutes for personal (oral) instruction.

Being, as before stated, only a beginner, it would be ridiculous to recommend a particular make; but this is not necessary; for the purposes of the pharmacist the microscope of any *respectable* optician is the best. The differences between the various makes are only perceptible when employing high amplifications, say 800 to 1,000 and more diameters. I only take the liberty to remark that we here in Philadelphia have Zentmayer, 147 South Fourth street; Queen, 924 Chestnut street, and the branch of R. & J. Beck (London), 921 Chestnut street—of course nearly every seller of optical instruments keeps microscopes.

Those wishing for further guidance are referred to the synopsis of American microscopes, by R. H. Ward, in the "American Naturalist," vol. vi, 1872, p. 323 and 326.

The time is not far distant when a microscope will belong as much to the *necessary* outfit of a well-appointed drug store as a pair of Troemner's or Becker's prescription scales.

INFUSUM DIGITALIS.

BY DELBERT E. PRALL, PH.G.

From an Inaugural Essay.

As this officinal infusion contains two fluidounces of tincture of cinnamon to the pint it will keep for a considerable length of time without decomposing, the tincture of cinnamon containing sufficient alcohol to preserve it. It is, therefore, sometimes kept on hand ready to dispense. But soon after it is made it becomes turbid, and an unsightly precipitate is formed which usually settles at the bottom of the bottle, and the question arises: Would it be proper to filter and dispense it clear, or does the precipitate contain some of the active principles of the digitalis? To ascertain whether the precipitate contains digitalin the following experiments were made: From German digitalis leaves 138 fluidounces of infusion were made by the Pharmacopœia process. In a few hours it became turbid. It was allowed to stand two months; at the end of this time some of the precipitate had settled to the bottom of the bottle and a part remained suspended in the liquid. I then began to filter it through paper pulp. It came through clear, but

after a portion had stood a few days a precipitate was again formed. This portion was returned to the filter and, as in each successive portion a precipitate was formed after standing, the filtration was continued until the whole quantity had passed through the pulp four or five times, the process of filtration occupying six weeks.

As it seemed disposed to precipitate for an indefinite length of time, I commenced operating on the precipitate I had obtained, which I estimated to be not more than two drachms. First washed the pulp with which it was mixed with distilled water, then dried the whole on a water-bath, introduced it into a percolator and moistened with menstruum of three parts of stronger alcohol and one part of distilled water; as soon as dropping commenced, corked and set aside in a moderately warm place for four days; then removed the cork and continued the percolation, adding, when the liquid had disappeared from the surface, two fluidounces of the same menstruum and afterwards diluted alcohol, until five and one-third fluidounces of percolate were obtained; evaporated the percolate to one fluidounce, added 10 minims acetic acid and 8 grains animal charcoal; set aside for 24 hours, filtered, obtaining a clear solution; almost neutralized with aqua ammoniæ, then gradually added 25 grains of tannic acid dissolved in one fluidounce of distilled water. The mixture remained clear. From this I inferred the absence of digitalin.

Inferring from my observations that the precipitate in infusion of digitalis is caused by the cinnamon, I made a quart of infusion omitting the tincture of cinnamon and using instead the required quantity of alcohol and water in the proportions used in making tincture of cinnamon. The result was a preparation that remained clear for a much longer time than the officinal infusion.

As an additional proof that the precipitate is caused by cinnamon may be cited the precipitate that is formed in each of the liquid preparations of the U. S. Pharmacopœia containing cinnamon. To prove that these precipitates are caused by cinnamon the following experiments were made:

Cinnamon was exhausted by alcohol in the same proportion as directed for elixir of vitriol, and then mixed with the requisite quantity of sulphuric acid. This mixture remained clear only a few minutes, then a copious precipitate was formed. Ginger, treated in precisely the same manner, gave a liquid which was permanently clear, and when

mixed with the cinnamon preparation the result was, apparently, the official elixir of vitriol.

For an aqueous preparation the compound infusion of catechu was selected. A portion was made according to the official process and another portion omitting the cinnamon. In the official a precipitate settled to the bottom in a few hours, in the portion from which the cinnamon was omitted no such precipitate was formed.

Though the tests to which the precipitate in the official infusion of digitalis was subjected would seem to indicate that it contains no digitalin, and that it would, therefore, be proper to pour off and dispense the supernatant liquid, yet this does not afford a satisfactory preparation, it being turbid, unpalatable and, if recently made, liable to further precipitation. In the hope of discovering a formula that would prove a desirable substitute for the present official process, I made the following experiments, using the English leaves, which I found to yield a precipitate similar to that from the German leaves: To one-half pint of the aqueous infusion I added an elixir of licorice made according to Kennedy's formula (*"Am. Jour. Pharm.,"* 1876, p. 231), but before enough had been added to mask the bitter taste, a precipitate was formed. To another portion of the infusion spirit of cinnamon was added, but with the same result. I then tried exhausting one drachm of digitalis with three fluidounces of boiling water, adding, when cold, five fluidounces of distilled cinnamon water, and filtering. And the same process was followed using cinnamon water made from the oil. These two preparations were unexceptionable in appearance, but the bitter taste of the digitalis was not disguised.

I next used glycerin, adding it to the official infusion. I ascertained that to prevent precipitation there must be added to one-half pint of infusion at least two fluidounces of glycerin, which should first be mixed with the fluidounce of tincture of cinnamon and then added to the aqueous portion. This affords the most palatable preparation of any that I have tried, and has stood for several weeks without any signs of precipitation; but the quantity of glycerin required is objectionably large.

From the foregoing it will be seen that I have not succeeded in discovering an unobjectionable adjuvant for the infusion which will disguise the taste of digitalis without producing a precipitate. Generally, in pharmaceutical preparations, it is desirable to avoid occasioning a

precipitate, and especially is it desirable to avoid dispensing a preparation which when it leaves the dispensing counter is clear and yet in an hour or two throws down a copious precipitate. Such a change is apt to cause a suspicion in the mind of the patient and to embarrass or prevent the usefulness of the medicine. The present Pharmacopœia process for infusion of digitalis is objectionable, because it not only causes a copious precipitation within a short time after the infusion is made, but the cause of the precipitate—the tincture of cinnamon—is almost a useless addition, as it does not materially improve the taste of the preparation. The writer therefore suggests that it would be desirable to have the present Pharmacopœia process replaced by one which would direct simply the aqueous infusion filtered through paper, and omitting the tincture of cinnamon. Such a preparation has an excellent appearance; it could be prescribed with directions to follow each dose with syrup or other adjuvant which would modify the bitter taste, and it remains clear long enough to allow the patient to take, in ordinary doses at proper intervals, as much as is usually ordered in a prescription.

TOBACCO STATISTICS.

Tobacco was unknown to Europeans until after the discovery of America by Columbus. Samples of it were taken to England, and the use was there made fashionable by Sir Walter Raleigh and others, who had acquired a taste for it in Virginia, where it held an important place in all Indian ceremonies.

The United States is the greatest tobacco-producing region of the world, and yet, with its hundreds of millions of pounds produced, and its millions of revenue, the area planted is most insignificant. The statistics for 1875 give but 559,049 acres of land in all the States and Territories planted in tobacco, or about forty townships, making two ordinary-sized counties, as the gross area of this country supplying the world with the weed.

As a producer Kentucky takes precedence, as will be seen from the following statement:

Kentucky, 1875,	130,000,000 lbs.	North Carolina, 1875,	14,750,000 lbs.
Virginia, 1875,	57,000,000	Ohio, 1875,	13,500,000
Missouri, 1875,	40,000,000	Indiana, 1875,	12,750,000
Tennessee, 1875,	35,000,000	Connecticut, 1875,	9,900,000
Maryland, 1875,	22,000,000	Massachusetts, 1875,	8,500,000
Pennsylvania, 1875,	16,000,000	Illinois, 1875,	8,000,000
Pennsylvania, 1876,	35,000,000 ¹		

¹ 30,000,000 lbs. were raised in Lancaster county alone.

The above are the figures for the census of 1875.

Soil.—The soil required should be deep, of a sandy or loamy nature; rich, mellow and warm virgin soil is better than old land. It should be of a rolling nature and with an eastern or southern exposure if upon a hill; lowlands, river bottom lands do well if not subject to overflow. Of all the districts now engaged in cultivating this plant Connecticut and Pennsylvania present the highest average yield, 1,600 lbs. per acre, as taken from the report of the Commissioner of Agriculture for the United States.

Kentucky averages 630 lbs. per acre.			N. Hampsh'e averages 1600 lbs. per acre.		
Virginia	"	630	"	800	"
Missouri	"	850	"	1350	"
Maryland	"	675	"	550	"
West Virginia	"	680	"	750	"
N. Carolina	"	500	"	317	"
Tennessee	"	675	"	465	"
Ohio	"	700	"	822	"
Indiana	"	500	"	500	"
Illinois	"	550	"	670	"
Texas,	"	650	"		

This report is for 1875.

The large average yield in Pennsylvania now exceeds that of any other State. This result is mainly due to the excellence of her soil and farming combined.

H. N. R.

TOBACCO CULTIVATION IN VIRGINIA.

By DAVID PATRICK MILLER, PH.G.

From an Inaugural Essay.

The cultivation of the tobacco plant constitutes one of the most important branches of agricultural pursuit in the State of Virginia, it being in some sections the chief product of the soil. The extent of its cultivation is shown by the fact that the total yield of the tobacco crop for the year 1875 in Virginia was 65,000 hogsheads, which, valued at \$120 per hhd.—about the average value—makes the total value of the crop \$7,800,000, or about one-fourth of the value of that of the whole United States for that year.

Tobacco is one of the most exhaustive of crops, requiring a dark, rich soil, which must be renewed annually with manures and other

fertilizers ; moreover, it requires strict care and close attention during the whole period of its growth. Yet the high price generally paid for good tobacco, which has been well cured, fully repays the planter for his time and trouble expended. The kind most generally cultivated in Virginia is the "common" tobacco (as it is called), the *Nicotiana tabacum* of our Pharmacopœia, a tall, stately plant, sometimes attaining the height of five or even six feet and having large, broad leaves, some of which attain a length of two feet. The first step in the cultivation of tobacco is sowing the seed in a "plant bed," which is accomplished in the following manner : A warm, dry spot with a southern exposure being selected, it is prepared for the reception of the seed by having the ground cleared and all the sticks, brushwood, etc., upon it burned and the ashes raked over the surface ; this process effectually rids the ground of the seed of weeds. The seeds are so minute that they require to be mixed with sand and scattered broadcast, and even then, as is the case with many other small seeds, many do not germinate from being sown too deep. After the seeds are sown the "bed" is surrounded by a temporary fence, to protect it from the depredations of cattle, and the young plants, when they appear, are watched carefully, being watered regularly and liquid manures sometimes applied to them to hasten the growth ; they must also be protected during chilly nights by having cloths spread over the "bed." Sometimes the "bed" is attacked by flies, which play sad havoc among the plants, and necessitate a replanting.

When the plants have attained a height of six to eight inches, they are ready to be transplanted, which is best done just after a rain. The ground, having been previously prepared for the reception of the plants by manures or fertilizers, is divided off into rows running about three feet apart one way and four the other ; at the squares formed by the intersections of these rows hills of earth are heaped up, in which the plants are set out.

The planting is done in this manner : Some of the men take a number of the plants in baskets, and each one selecting a row of hills, traverses the entire distance of the field, dropping a plant upon each hill ; each one of these is followed by a second person, who takes up the plant, and making a hole in the top of the hill with a stick which he carries in his hand, inserts the plant in it and levels the earth around it.

When the transplanting is finished, the plants do not generally require

any attention for a while ; pretty soon, however, in some cases, they are attacked by worms, chief among which is a large green worm, which, if let alone, would soon destroy the entire crop. This worm, the same which infests tomato plants but which is commonly called the "tobacco worm," is generally found on the under surface of the leaves, and, being of the same color, is not quickly detected by inexperienced persons. It is very voracious, feeding upon the green leaves and attaining sometimes the size of the little finger and a length of two to three inches.

Each plant must be examined closely for several days, in order to be rid effectually of these worms, the process of removing which is termed "worming." Sometimes they appear in such numbers that the whole "force" has to be put to work to kill them, or the result would be very disastrous to the crop. After the plants have been pretty effectually rid of these pests, the next step in the cultivation is "priming," as it is termed. This consists in breaking off such of the lower leaves as are either small or touch the ground. Some planters, considering these of no value, do not care to save them ; others, on the other hand, prefer to cure them with the rest of the leaves, afterwards separating and sending them to market by themselves, where they are classified as "primings." Of course they bring a low price in comparison with the rest of the leaves, but generally enough to repay for the trouble of curing them.

The plants, which by this time have acquired considerable size, and are ready to flower, now require "topping." This consists in breaking off the tops, thereby causing all the nourishment, which would otherwise be expended upon the flowers, to be diverted to the leaves, resulting in their more rapid development. Soon after this operation is finished, buds appear in the axils of the leaves, which are termed "suckers," and the operation of removing which is called "suckering." This is a laborious occupation, as it must necessarily be kept up as long as the buds appear, since they would detract materially from the growth of the leaves.

After this the plants do not require much attention, being left alone until the leaves are ripe and ready to be cut, which is generally done in the latter part of September or first of October, if they have had a suitable season. Great care must be exercised in judging of the ripeness of the crop, as over-ripeness is to be guarded against as well as, if

not more, than its opposite. Experienced persons generally judge by the color and feel of the leaf. For cutting, a sharp knife, resembling that of a shoemaker, is used, and the plants are cut close to the ground, being severed with one blow. After being cut the plants are not gathered immediately, but are allowed to remain on the ground long enough to wilt but not to be burnt by the sun. The main stocks of the plants are now split about half way up, and the plants are then placed astraddle "tobacco sticks," which are five or six feet long and have been prepared for the purpose, and are thus carried, for the purpose of drying, to the "tobacco house," a building erected expressly for the purpose. This house is built of logs, generally with sufficient space between them to admit of a circulation of air; it has, besides, ventilators in the roof and rows of large poles, placed five or six feet apart, reaching from one side of the house to the other, the rows extending from the roof to within a few feet of the floor, resembling somewhat the rafters for the floors of a dwelling-house. The sticks containing the plants are placed across the poles, one row being filled up and then another, and so on until the building is full. A fire is now kindled in the middle of the floor and kept up without intermission for four or five weeks, at the end of which time the tobacco is generally sufficiently dried. During all this time it must be watched closely, the door being closed and a free circulation of air allowed through the ventilators; sometimes, however, a shorter time is required for drying. When the tobacco is dried, a damp day being selected, it is taken down preparatory to stripping. The leaves are all stripped from the plants and thrown into a heap by one man; another then assort's them, placing the most inferior in one parcel by themselves, the next in quality likewise together, and so on through the entire pile. Each parcel is done up separately into "hands," as they are called. This consists in gathering up the leaves, spreading them out, placing them one upon the other, and, when five or six ounces in weight have thus been obtained, tying the parcel around at the end with another leaf, which has been twisted to form a string. Having been all made up into "hands," the tobacco is packed preparatory for shipment to market; sometimes, however, when the market is not far distant, it is not packed, but simply transported loosely in wagons, and then constitutes "loose tobacco." It is packed sometimes in large boxes, but generally in large hogsheads. The packing is done in the following manner: A person gets into the

box or hogshead and, the tobacco being handed to him, he places it carefully in the bottom of the vessel, and then another layer upon this until it reaches a height of twelve or eighteen inches; he then gets out, and powerful pressure is applied by means of large screws and blocks to force the leaves into a small space; another layer is then put in, this is also compressed, and so on until the box or hogshead is filled and ready for shipment.

So far the tobacco is simply the dried leaves of the plant, and possesses none of the aroma for which it is so highly prized by those addicted to the use of it. This is acquired only after the tobacco has undergone a process called "bulking." This operation is conducted sometimes by the planters, but generally by the merchants who purchase it. It is done in the following manner: The tobacco is collected together into a compact circular heap, the butts of the hands being placed together in the centre, and the whole then covered with heavy blankets or other woolen cloths; it is allowed to remain in this condition until it undergoes a sweating process, during which the peculiar odor or aroma is developed.

This may be due to the liberation of some principle which was present before, or to some chemical change taking place between pre-existing principles; however, this is not known to be a fact, but is only a conjecture. The matter has never been fully made out; certain it is, though, that after the "curing" the leaves possess an entirely different odor from that which they had in the fresh state. After the operation of "bulking" is finished the tobacco is ready for the manufacturer's hands, to be made into smoking or chewing tobacco or snuff.

A FALSE PAREIRA BRAVA.

BY CHARLES MORRISON, PH.G.

From an Inaugural Essay.

The drug examined was of Brazilian origin, and sent to this country as true "pareira brava, obtained from *Cissampelos pareira*;" but it corresponded neither to the description of *Cissampelos* nor of *Chondodendron*. It consisted of the woody stems of a menispermaceous plant, was covered with a gray bark, and the bright-yellow wood was formed of more or less eccentric layers of fibro-vascular tissue.

The drug was reduced to fine powder, 12.0 grams of it, exposed to

a temperature of 200°F., lost 1.21 gram, equal to 10.1 per cent. Ten grams, dried as above, moistened with alcohol and packed firmly in a conical percolator, required 15½ ounces of alcohol to exhaust it. On again carefully drying, it was found to weigh 9.025 grams, showing the alcohol had taken up .975 gram. The percolate was evaporated to 2 fluidounces, and 25 drops of sulphuric acid added; on standing 2 days it threw down a precipitate of a dark yellow color, weighing .3665 gm. The balance of the drug was then exhausted with alcohol in the same manner, and the percolate reduced by evaporation to 3 fluidounces, to which, while hot, 40 drops of sulphuric acid were added. After two days a large quantity of dark-colored crystals, having a smell very similar to honey, was obtained. The mother-liquor was drained off and the precipitate washed with water acidulated with sulphuric acid, 20 drops to the ounce, until the coloring matter was all removed. The residue was dissolved in hot alcohol, from which it was thrown down, on cooling, in beautiful yellow stellate crystals, which were further purified with the aid of animal charcoal and by recrystallization from alcohol. The crystals resembled those of berberina salt in appearance, and to prove their identity the same tests were applied to both, when it was found that muriate of berberina readily volatilized, while the other product was carbonized and required the addition of nitric acid to make it volatilize readily. The berberina salt does not form a clear solution with ether, but the salt obtained was readily soluble, forming a bright-yellow solution. The berberina salt is less soluble in cold water and almost insoluble in ammonia water, while the other is readily soluble. Treating boiling aqueous solution of each with a solution of bichromate of potassium, the product of the false pareira did not show any signs of precipitation until it had stood ten to fifteen minutes after becoming cool, while berberina formed a precipitate before it had become cool, the precipitates in both cases being fine needle-like crystals. On adding a drop of muriatic acid to each of the above precipitates, diffused in water and heating, the solution remained clear after cooling, while berberina threw down a bulky precipitate.

Treating cold aqueous solutions of each with a solution of nitrate of silver in hyposulphite of sodium, the pareira alkaloid was not precipitated, nor was the clear solution changed by heating, while berberina threw down fine, light-colored, needle-like crystals, the clear solution also being unaffected by heat. To a hot alcoholic solution of each a

solution of iodine in iodide of potassium was carefully added ; berberina threw down a precipitate of beautiful green spangles, while the other deposited a reddish-brown crystalline precipitate. The dark-brown substance having a sweet, honey-like odor, above referred to, was readily soluble in ether and in hot and cold alcohol ; insoluble in petroleum benzin ; soluble in caustic potassa, which solution was not precipitated by muriatic or sulphuric acid. The ethereal solution, on evaporation, yielded a powder of a brown color.

The filtrate from the first precipitate obtained with sulphuric acid gave a precipitate with ammonia water which was not re-dissolved on adding an excess. The sulphuric acid was removed with carbonate of barium ; the liquid acidulated with hydrochloric acid and treated with Mayer's test gave a heavy precipitate of a light-yellow color. The filtrate rendered alkaline by ammonia, and agitated with ether, it was found not to take up anything. On treating the precipitate by Mayer's test with an excess of carbonate of potassa, it was turned of a dark dull-red hue, and gave, with a mixture of one part of ether and two of alcohol, a light-yellow solution, from which a slight reaction with Mayer's test was obtained ; with solution of iodine in iodide of potassium light-yellow crystals were formed.

It appears from the above that this false *pareira brava* contains two alkaloids, both of a yellow color, one of which is similar to berberina, but differs from it in several important reactions.

LIQUOR POTASSÆ.

BY ED. ROSENTHAL, PH.G.

From an Inaugural Essay.

Of the many chemical preparations of the *Pharmacopœia*, there is none, perhaps, the working formula of which is more simple than that of the subject of this paper ; and it might be supposed that in consequence thereof the product should be at once pure and of a standard strength. With a view to ascertain if such is really the case, and to find out what the impurities are, if any, also how near the average article, produced according to the officinal formula, approached to the standard of the requirements of the *Pharmacopœia*, I have investigated the subject as follows below. The cheapness of the material used in the preparation leaves no reason to suppose that any impurities therein could exist

by adulteration ; still, through carelessness or neglect of the operator, potassium carbonate, silica, alumina and lime salts are sometimes found to such an extent that they will impede the application for therapeutical but more especially for chemical purposes.

Of seventeen samples of liquor potassæ, purchased from a corresponding number of reputable pharmacists, which I have examined, I find that a deficiency of strength was the principal defect. They are found to range in specific gravity from 1·036 (one) to 1·065 (one) and to require for 48·02 grams from 38 to 50 cubic centimeters of volumetric solution of oxalic acid.

Made by the first process of the Pharmacopœia, viz, boiling bicarbonate of potassium with lime, the solution was in most cases obtained of the specific gravity 1·047 ; and when made by dissolving a troyounce of potassa in a pint of distilled water, it had the density of 1·053.

Hence either the specific gravity as required or the formula is incorrect. But taking for granted that the specific gravity is considered the standard for liquid preparations, I have, after many experiments, ascertained the formulas by which the quantity directed to be made (seven pints) coincides with the specific gravity 1·065, which I submit below :

Take of Bicarbonate of potassium,	17 troyounces and 160 grains.
Lime,	11 " " 160 "
Distilled water,	a sufficient quantity.

Dissolve the bicarbonate of potassium in 4 pints of distilled water and heat the solution until effervescence ceases ; then add distilled water to make up the loss by evaporation, and heat the solution to the boiling point. Mix the lime with 4 pints of distilled water, and, having heated the mixture to the boiling point, add it to the alkaline solution and boil for ten minutes. Then transfer the whole to a muslin strainer, and, when the liquid portion has passed, add enough distilled water through the strainer to make the strained liquid measure 7 pints. Lastly, keep the liquid in well-stopped bottles of green glass. Solution of potassa thus prepared has the specific gravity 1·065, and contains six and six-tenths per cent. of hydrate of potassium.

Solution of potassa may also be prepared in the following manner :

Take of Potassa,	640 grains.
Distilled water,	one pint.

Dissolve the potassa in the distilled water, and allow the solution to stand until the sediment subsides; then pour off the clear liquid and keep it in a well-stopped bottle of green glass. The specific gravity of the preparation of this formula is 1.065, and 48.02 grams of it will take 50 cc. of volumetric solution of oxalic acid for complete neutralization.

LABORATORY NOTES ON FLUID EXTRACT OF CIMICIFUGA.

By J. U. LLOYD, Cincinnati, O.

(Continued from page 15.)

The formula of the Pharmacopœia, carefully followed, did not yield a fluid extract representing the powdered cimicifuga. The formula suggested for solid extracts, on page 1164, U. S. D., was inferior. The operation of repercolation slightly excelled the officinal, but was surpassed by simple percolation without maceration, which excelled all. The experiments offered show that height of powder exerts a direct influence upon the extractive power of the menstruum, up to fifteen inches (beyond this none were offered), increasing the amount of material dissolved, as the perpendicular height of the powder increased.

Theory indicates that this must be a natural law, and the writer believes that a comparison of processes, if just, must establish this point.

Thirty-four experiments, heretofore introduced, were for the purpose of comparing the several processes of percolation under the circumstances given; and under like conditions only can just comparisons be made.

I now continue the subject and give two tables, in which critical comparisons are made of fractional parts of the percolate at each stage of the operation.

The first column of the tables gives the number of the percolate and the amount. The second column the grains of dry extractive matter in each cc. after an exposure of twenty-four hours in a watch crystal, in a drying room, temperature 140°F. The third column gives the number of grains contained in each fluidounce of the percolate. It was obtained by multiplying the amount in each cc. by 29.52. The fourth column expresses the number of ounces the entire percolate represented, calculating seventy grains extractive matter in each

fluidounce, while the fifth column gives the actual expense of each ounce of percolate, estimating alcohol to be worth \$2.24 per gallon, and the 7,680 grains *cimicifuga* 20 cents.

The comparisons in these two tables are based upon the supposition that equal proportions of all principles continue to be abstracted until the powder is depleted.

This consideration is necessary here, but my previous statement will be remembered, that my experiments do not permit me to believe each portion of a percolate contains the same component principles, a point yet to be considered.

TABLE 9. *Simple Percolation, 7,680 grains Cimicifuga.*

Percolate, Fluid ounces.	Grains extract'e mat- ter in each cc.				Percolate, Fluid ounces.	Grains extract'e mat- ter in each cc.			
	Grains.	Grains.	Ounces.	Cents.		Grains.	Grains.	Ounces.	Cents.
1	3'33	98'30	1'40	45'54	13	'77	22'73	9'00	9'53
2	2'80	82'66	2'58	25'39	14	'68	20'07	9'30	9'30
3	2'38	70'26	3'59	18'73	15	'58	17'12	9'53	9'25
4	2'19	64'65	4'71	14'65	16	'35	10'33	9'68	9'29
5	1'94	57'27	5'33	13'27	17	'36	10'62	9'83	9'33
6	1'71	50'48	6'05	11'98	18	'32	9'45	9'96	9'38
7	1'43	42'21	6'66	11'15	19	'23	6'78	10'06	9'46
8	1'34	39'56	7'22	10'53	20	'22	6'49	10'16	9'54
9	1'12	33'36	7'68	10'11	21	'22	6'49	10'25	9'63
10	'84	24'80	8'03	9'90	22	'21	6'20	10'34	9'72
11	'79	23'33	8'37	9'70	23	'22	6'49	10'43	9'80
12	'73	21'54	8'68	9'56	24	'21	6'20	10'52	9'88

Simple Percolation without Maceration.—In a percolator two and forty-five-hundredths inches in diameter, prepared like those mentioned on page 4, January No , 7,680 grains of powdered *cimicifuga*, previously moistened with four fluidounces of alcohol, were introduced, and pressed until it occupied fifteen inches in height. After covering the powder with a circular piece of paper, alcohol was supplied, continuously, until twenty-four fluidounces of percolate were obtained. The percolate, as it passed, was separated into portions of one fluid-ounce each.

Cost.—If the percolation had been arrested when the first fluidounce passed, it would have represented one and four-tenths troyounces of *cimicifuga*. To obtain this we used 7,680 grains of *cimicifuga*, the alcohol absorbed (twenty-four fluidounces), and the alcohol in the percolate. Calculating the sixteen troyounces of powdered *cimicifuga* at twenty cents, and alcohol at \$2.24 per gollon, we have $45\frac{5}{100}$ cents as the actual cost of one standard fluidounce of fluid extract, providing the operation were now suspended. Each following fluidounce decreased in price until the fifteenth was reached, which cost $9\frac{2}{100}$ cents, after which there is a steady increase in cost. The twenty-fourth, costing $9\frac{8}{100}$, is almost exactly that of the tenth. This increase is due to the fact that the alcohol in the percolate, after the fifteenth ounce, is worth more than the extractive contained. Consequently, from a pecuniary view the point to suspend the operation in this case was the fifteenth ounce. Had this been done without any evaporation, each fluidounce would have cost $9\frac{2}{100}$ cents, while each fluidounce of the finished extract, U. S. P., after reserving fourteen fluidounces and evaporating the ten following to two, and adding to reserve percolate, cost $9\frac{5}{100}$ cents.

If the operation had been suspended at the fourteenth ounce, each ounce would have cost $9\frac{3}{100}$ cents and contained forty-six and five-tenths grains extractive matter, and, without evaporation, would have represented more *cimicifuga* to each ounce, at a less price, than the sixteen ounces of extract prepared from twenty-four ounces of percolate by the aid of heat.

Rate of Exhaustion.—The first fluidounce of percolate contains ninety-eight and three-tenths grains of extract, representing one and four-tenths ounces of the *cimicifuga*. The second fluidounce contained eighty-two and sixty-six hundredths grains; less in amount than the preceding, but still more than was necessary to represent four hundred and eighty grains of *cimicifuga*. The two ounces of the percolate represent two and fifty-eight hundredths ounces of *cimicifuga*. Following the column downward, we find the amount of extractive matter constantly decreases, until the sum of the extractive at the sixth fluidounce of percolate represents six and five hundredths grains of *cimicifuga*, almost exactly troyounce to fluidounce. Consequently, had the operation been suspended at this point, we would have obtained, without the use of heat, six ounces of fluid extract, repre-

senting the powder operated upon. At the fifteenth ounce, the cheapest point in the entire process, we represent nine and fifty-three hundredths troyounces of powder. The sixteenth ounce adds but ten and thirty-three hundredths grains extract, bringing the amount to nine and sixty-eight hundredths ounces.

The decrease in extractive matter continues till the twenty-first ounce is reached. This contains the same as the twentieth and twenty-third, viz.: six and forty-nine hundredths grains. The twenty-second is identical in amount with the twenty-fourth.

The last ten fluidounces of the percolate only add eighty-six and seventeen hundredths grains extractive matter, which is less than was contained in either the first or the second ounce of percolate. It only adds one and twenty-two hundredths troyounce of cimicifuga, to obtain which we expend eight fluidounces of alcohol. In reality it adds two fluidounces to the fourteen ounces of the reserved tincture, but this increase of bulk is deceptive, inasmuch as it dilutes the reserve. The fourteen fluidounces of reserved tincture contain 651.22 grains of dry extractive matter, an average of forty-six and fifty-one hundredths grains to each fluidounce.

The two ounces of evaporated tincture contain, in each, but forty-three and nine hundredths grains. Consequently, if the operation had been suspended at the fourteenth fluidounce of percolate, each ounce, without the use of heat, would have represented more cimicifuga than did each fluidounce of the finished extract. The expense would have been less.

Amount of cimicifuga used (see table 10), twenty-four troyounces. Height of powder, fifteen inches. Diameter of percolator, three inches.

Moistened with six fluidounces of alcohol. Inserted into percolator and prepared for percolation like the preceding. When the percolate appeared one fluidounce was obtained. The operation was suspended and maceration continued sixteen hours at temperature 100°F., when seven ounces were run off.

Maceration, in like manner, was again continued until the same time upon the following day. Eight fluidounces were then procured. In like manner, interrupted percolation was employed until the eighty fluidounces of the percolate had been obtained. The time allowed was thirty minutes to each fluidounce. Eight percolates were obtained

each day. After the thirty-second, each percolate contained two fluidounces.

TABLE 10. *Simple Percolation, 11,520 grains Cimicifuga.*

Percolate.	Grains extractive matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of one ounce fluid extract at each of the 56 stages, calculating 70 grains dry extract to each ounce.	Percolate.	Grains extractive matter in each cc.	Amount of dry extract contained in each fluidounce.	Calculating 70 grains to each fluidounce, the total percolate will make fluid extract.	Cost of one ounce fluid extract at each of the 56 stages, calculating 70 grains dry extract to each ounce.
1 fluidounce.	Grains.	Grains.	Ounces.	Cents.	1 fluidounce.	Grains.	Grains.	Ounces.	Cents.
1st floz.	2.85	84.13	1.20	78 3	30th floz.	.56	16.53	23.04	6.31
2.	3.10	91.51	2.51	38 4	31.	.54	15.94	23.27	6.32
3.	2.94	86.79	3.75	28.9	32.	.51	15.05	23.48	6.34
4.	2.63	77.64	4.86	20.5	2 floz.				
5.	2.57	75.87	5.94	17.1	33.	.48	14.16	23.88	6.34
6.	2.41	71.14	6.96	14.8	34.	.38	11.21	24.20	6.44
7.	2.28	67.31	7.92	13.3	35.	.37	10.92	24.52	6.50
8.	2.12	62.58	8.81	12.1	36.	.33	9.74	24.80	6.57
9.	2.66	78.52	9.93	10.9	37.	.29	8.56	25.04	6.64
10.	2.28	67.31	10.89	10.1	38.	.27	7.97	25.27	6.72
11.	1.96	57.86	11.72	9.58	39.	.29	8.56	25.52	6.79
12.	1.90	56.09	12.52	9.10	40.	.28	8.26	25.75	6.87
13.	1.89	55.79	13.32	8.68	41.	.29	8.56	25.99	6.94
14.	1.84	54.32	14.09	8.33	42.	.28	8.26	26.23	7.01
15.	1.89	55.79	14.89	8.00	43.	.30	8.85	26.48	7.08
16.	1.89	55.79	15.69	7.71	44.	.25	7.38	26.69	7.15
17.	2.37	69.96	16.69	7.35	45.	.28	8.26	26.93	7.22
18.	1.99	58.74	17.53	7.10	46.	.26	7.67	27.15	7.29
19.	1.63	48.12	18.22	6.93	47.	.27	7.97	27.37	7.36
20.	1.51	44.58	18.85	6.74	48.	.29	8.51	27.62	7.42
21.	1.47	43.39	19.47	6.66	49.	.37	10.92	27.90	7.47
22.	1.39	41.03	20.06	6.56	50.	.29	8.56	28.18	7.52
23.	1.19	35.13	20.56	6.48	51.	.26	7.67	28.40	7.59
24.	1.12	33.06	21.03	6.42	52.	.26	7.67	28.62	7.64
25.	1.19	35.13	21.53	6.38	53.	.27	7.97	28.84	7.71
26.	.89	21.91	21.91	6.32	54.	.28	8.26	29.09	7.76
27.	.80	22.25	22.25	6.30	55.	.29	8.56	29.32	7.82
28.	.70	22.54	22.54	6.299	56.	.26	7.67	29.54	7.88
29.	.62	18.30	22.80	6.30					

Cost.—The first fluidounce represented one and two-tenths troy-ounces of cimicifuga. To obtain this we used twenty-four troy-ounces of cimicifuga, the absorbed alcohol (thirty-six fluidounces) and the

alcohol in the percolate, total equivalent to $78\frac{3}{10}$ cents. The second represents one and thirty-one hundredths ounce. Each following ounce decreased in price to the twenty-eighth, costing six and three-tenths cents, the most economical point.

After this there is a steady increase to the thirty-sixth, which is almost exactly that of the twenty-second. The increase in cost continues to the end of the operation, at which point we find each ounce costs $7\frac{88}{100}$ cents, about what would have been had we discontinued the process at the fifteenth ounce. Had we reserved the first twenty-one fluidounces, continued the operation to the thirty-seventh, and evaporated last percolate to three fluidounces, and added the same to reserved portion, we would have obtained an extract costing $6\frac{57}{100}$ cents per ounce.

Rate of Exhaustion.—The first fluidounce of percolate contained eighty-four and thirteen-hundredths grains, representing one and two-tenths ounce of cimicifuga. The second fluidounce contained ninety-one and fifty-one hundredths grains, which is seven and thirty-eight hundredths grains more than the first. Following, we find a general decline to the ninth ounce, which contains more than the eighth. Again, there is a decline in each successive percolate, and when we arrive at the fourteenth we find the total percolate contains extractive matter enough to represent fourteen and nine hundredths ounces of cimicifuga; consequently, had the operation been suspended at this point, we would have obtained, without the use of heat, fourteen fluidounces of fluid extract, each ounce representing four hundred and eighty grains of cimicifuga. The fifteenth and sixteenth fluidounces contained one and forty-seven hundredths grain more than the fourteenth. The seventeenth rose to sixty-nine and ninety-six hundredths grains, surpassing the fifteenth. Again, there is a decrease to the twenty-fifth ounce, which rises two and seven hundredths grains above the twenty-fourth. The twenty-eighth ounce is the most economical point at which to arrest the operation. Here we find twenty-two and fifty-four hundredths ounces of cimicifuga represented. From the twenty-fifth ounce to the thirty-ninth percolate, with a couple of unimportant exceptions, there is a general decline. After the thirty-ninth little regularity can be observed, the percolate not representing more than nine grains to the fluidounce, excepting the forty-ninth, and it does not fall to six grains. The forty-fourth percolate contains least

of all. If the first twenty-one ounces had been reserved, and the following fifteen evaporated to three and added to the reserve, we would have had a process similar to the officinal. The twenty-four fluid-ounces of fluid extract would have represented the powder employed upon the basis we calculate. The total matter contained in the eighty ounces of percolate represented twenty-nine and a half ounces of cimicifuga. As this amount is apparently five and a half ounces more than the powder operated upon, we find that by this process we have made a better percolation than we did in the experiment which gave us the base for our calculations, although in that case the proportion of alcohol to material was much greater. The increase of extractive matter after each maceration (one exception) will be noticed. The officinal amount of percolate contained 83.95 per cent. of the total matter extracted by fifty-six ounces.

This process may properly be called percolation with maceration.

Remarks.—It will be noticed that in neither table are we warranted from an economical stand in carrying the percolation to the extent directed by the U. S. P. It would have been better in both cases to have suspended the operation sooner, which amounts to the same as operating upon a larger amount of powder than sixteen troyounces to produce sixteen fluidounces of fluid extract.

In the process given under Table 10, twenty-four troyounces of material were employed against the sixteen ounces of Table 9. It will be seen that this increase in material was not followed by a corresponding increase of extractive matter in the first ounce of percolate.

I will refer the reader to Table 2, given in the January "Journal," where sixteen ounces of material in different percolators occupies different heights, thus increasing the contact between the alcohol and powder, followed by a general increase of extractive matter from those having the greatest amount of contact.

This I believe a law of nature, mathematically true. I will not consume time with the theory, unless exceptions are made to it.

Thus, while the twenty-four ounces of powdered cimicifuga (Table 10) occupied fifteen inches in height, it was exactly the same as that of the sixteen of Table 9. The alcohol used was identical in both processes.

Each drop of alcohol came in contact with exactly the same amount of material in its downward course, provided the packing of

the percolators was properly made. The temperature of this first ounce was the same; then why should we expect a drop of alcohol to possess greater solvent power in the one case than in the other. The principle is the same as where equal amounts of powder were made to occupy unequal heights, thus unequalizing the contact; for here unequal amounts of powder occupy identical heights, equalizing the contact. The smaller amount of powder is brought to a level with the larger.

One other point. Greater force is required to pack sixteen ounces of powder fifteen inches high into a percolator 2.45 inches in diameter than is required to pack twenty-four ounces the same height into a percolator three inches in diameter, the proportions being correctly calculated. In like manner, it required less pressure as the percolators increased in size to make the sixteen ounces of powder occupy the calculated heights given in the January "Journal." The friction between the sides of the percolator and the powder is greater as the percolators decrease, and this actually *seems* to increase the density of the powder in the small percolator, followed as it is by a delay of the menstruum in its passage through; so that actually we have greater maceration in the case of the smallest amount of powder.

This fact may have influenced the first ounce of percolate in Tables 9 and 10, as the small percolator required nearly an hour longer before the liquid appeared. This ounce contained ninety-eight and three-tenths grains of extractive matter against eighty-four and thirteen hundredths grains from the first ounce of percolate from the larger amount of powder.

I think there can be little doubt, not reasoning from this experiment, that height of powder governs the value of the extract, other conditions being the same. After the first ounce of percolate had been reserved, the conditions of the operation were changed. The small percolator was removed to a cold room where the temperature was near freezing, and the percolation continued to the end of the operation. The other was placed in a location where the thermometer registered, most of the time, 100°F., and interrupted percolation pursued as before explained.

Result.—The percolate from the former run steadily down as regards dissolved principles; that from the latter exhibited a remarkable line of pulsations, corresponding exactly with the periods of maceration.

The former fell behind corresponding experiment at ordinary temperature (see Table 2, January "Journal"). The latter surpassed anything which has been offered, and the indications are that this increase of value resulted from the mode of percolation, in conjunction with the temperature.

I have taken it for granted that the increase in the extractive matter by maceration and heat are an advantage to the finished extract. I have made my calculations on the supposition that the value of the extract varies with the proportion of extractive matter, a point I have experimented much on, though not yet presented.

From those interested in my article in the January number I have have received many suggestions, but I cannot touch now upon all the points, wishing to avoid wandering, and to confine my remarks to a few points that may be considered with regard to the experiments given in each article. It will not do to make generalizations unaccompanied with reasons for same, and to give tables and remarks for even a few of the important points that suggest themselves would require more space than could be placed at my disposal.

If I have made any unjust comparisons I will consider it a kindness to be informed of the fact. There are errors creeping into all lines of experiments, but they can generally be corrected.

To Prof. Hough, of this city, I express my gratitude for the tedious check weighing he made of a very important portion of the experiments offered in the January number. In answer to the question which ended the article in that number, I think it may be safely said, We can, perhaps, though we must increase the material worked, and decrease the percolate obtained, if we apply the principle economically.

NOTE BY THE EDITOR.—It is due to Mr. Lloyd to state that the paper intended as a continuation of his essay closing on page 15 of the present volume was, after a delay occasioned by fire, received by us while Dr. Squibb's paper on page 209 was in the printer's hand. At our request Mr. Lloyd withdrew that paper and consented to go again over the same ground.

COLD PROCESS FOR SYRUPS.

BY R. H. B. HUNSTOCK, PH. G.

Abstract of a paper read before the Alumni Asso. of the St. Louis College of Pharmacy.

To improve this class of preparations, and to bring them as near as possible to a state of perfection, an entire change in the mode of preparation is necessary. The reformatory process that I propose to bring to your notice this evening is by no means a new one; Mr. Orinski, in the "Druggists' Circular" for March, 1871, refers to it, and the "American Journal of Pharmacy" for September, 1875, contains rather a concise explanation of the workings of the process and directions for its application, written by myself. This process is mainly peculiar in this respect, that in the manufacture of syrups *heat is excluded*. This, of itself, is plainly shown to be of great importance, especially for making such syrups as are esteemed for their delicate flavor, or have as the important medicinal ingredient a volatile, active principle. To explain as concisely as possible the necessary steps in the process I will take *simple syrup*. Thirty-six troyounces of sugar are to be dissolved in twenty fluidounces of distilled water, and sufficient distilled water afterwards added to make the whole measure forty-four fluidounces; the solution having been accomplished, the result will be simple syrup of the officinal strength. To effect this solution I take a one-gallon percolator of the ordinary shape and introduce, lightly, into the lower orifice a small piece of sponge, next introduce the sugar (granulated), and upon this pour the water, the apparatus being adapted as is usual in the process of percolation. The percolator may be covered loosely to keep out flies and dust, and the operation will proceed without further attention, the syrup coming through drop by drop. If it should be necessary to use crushed sugar the percolator must be corked at the lower orifice, the sugar and water introduced and allowed to macerate until the former has dissolved down to *half its bulk*, when the cork may be removed and the liquid be allowed to drop. If, after the liquid has all passed, there remain a quantity of undissolved sugar in the percolator, enough may be poured back to dissolve it, afterwards adding sufficient water to bring the whole up to the measure of two pints and twelve fluidounces.

To be successful in your first attempt at using the process, you must exercise care in several particulars, viz.:

1. The percolator used should be cylindrical or semi-cylindrical, and cone-shaped as it nears the lower orifice.

2. The sugar must be coarse, else it forms into a compact mass, which the liquid cannot permeate.

3. The sponge must be introduced with care. If pressed too tightly in it will effectually stop the process; if too loosely, the liquid will pass too rapidly and will, in consequence, be weak and turbid (not properly filtered).

The simple syrup produced by this process will be clear and transparent, of an unvarying consistency, and will not crystallize, simply because the water, when saturated, is of the same temperature as the surrounding air; and in like manner you may prepare the other officinal syrups. Obtain a menstruum by following the directions laid down in the Pharmacopœia, and lastly, instead of "dissolving the sugar by means of a gentle heat," introduce it into a suitable percolator and pour the liquid upon it, merely observing the directions for preparing simple syrup.

Of all the officinal syrups, the *compound syrup of squill*, on account of its liability to fermentation, is probably the most troublesome. Let the seneka and squill be exhausted and a menstruum prepared after the manner laid down in the Pharmacopœia; in this carefully prepared liquid let the sugar be dissolved by percolation; afterwards dissolve the tartrate of antimony and potassium in a small quantity of boiling distilled water, and add to the syrup. The result is a clear, thick, light-brown syrup, which I have never known to spoil. In the course of a few months there will occur a flocculent deposit which may be removed by straining.

To improve the appearance of *syrup of rhubarb* I add to the fluid extract twenty grains of carbonate of potassium, dissolved in a small quantity of distilled water, and afterwards sufficient simple syrup to make up the measure of one pint. The potassa dissolves the resinous matter in the fluid extract of rhubarb, and the result is a clear and highly-colored syrup.

The officinal process for *syrup of orange-peel*, I consider, gives us quite an inferior preparation. Heat is applied (and not always carefully) to evaporate the tincture and finally to dissolve the sugar, and the result generally is to destroy the delicate flavor which we prize, and which makes it so popular as an excipient. I find the following process gives

a very excellent result. In the first place, make a concentrated tincture of orange from the fresh peel, recently dried and ground, of the strength of eight troyounces to the pint, using a menstruum of three parts alcohol and one part water, then

Take of Concentrated tincture of orange,	f $\bar{3}$ iv.
Carbonate of magnesium,	5vi.
Sugar (granulated),	5xxviii.
Water, q. s.	

Triturate the tincture with the magnesium and one and a half troy-ounce of sugar in a mortar, gradually adding eight fluidounces of water during the trituration. Pour this upon a filter and add from time to time sufficient water through the filter to make the filtrate measure sixteen fluidounces. Pour the filtrate upon the sugar contained in a percolator, and proceed as in the case of simple syrup.

Syrup of iodide of iron, made as follows, gives a good result :

Take of Iodine,	3ii.
Iron wire (cut),	gr.ccc
Distilled water, q. s.	
Sugar,	5xliiiss.

Mix the iodine, iron and three fluidounces of distilled water in a suitable glass vessel, and set aside until the reaction ceases and the combination is complete ; filter the solution and add six fluidounces distilled water to the filtrate. Pour this upon the sugar contained in a covered percolator, and which has been adapted to an air-tight receiver ; allow to drop slowly, and when the liquid has passed and the sugar is all dissolved add sufficient distilled water to make the whole measure twenty fluidounces. This gives a syrup alike in character and strength to the officinal and requiring only the same precautions for its preservation.

SYRUPS vs. COLD PERCOLATION.

BY WM. C. BOLM, PH.G.

Abstract of a paper read before the Alumni Asso. of the St. Louis College of Pharmacy.

I propose to show that the cold process for making syrups is not what we want, that it has been weighed and found wanting.

It is claimed that in making simple syrup by this process it will be clear, transparent and of an unvarying consistency, because it is of the same temperature as the surrounding air. I admit that it will be clear

and transparent, provided you have no mishap, but it is impossible to obtain as thick a syrup as you can when heat is used. To speak strictly about the scientific properties of a syrup made by the cold process and one made by heat, I must assert that the one made by heat is by far the best. It is a well-known fact that sugar prepared from the sugar cane contains more or less nitrogenous matter, and to some extent impurities of an organic basis. How is this impure matter removed? In making a syrup by heat you will always notice a large amount of scum, and by removing this scum you are removing all impurities which the sugar may contain. But it may be asserted that all this impure matter remains in the sponge which is used in the cold process. I beg leave to differ with the assertion, for I have prepared simple syrup in both ways, and I always found that I obtained more impure matter out of a syrup made by heat than out of the one by cold process. It is also claimed that heat is irregular and uncertain. This argument will not hold, for the officinal directions say plainly that the temperature shall be boiling point, and in order to obtain this you need no thermometer, for the naked eye will tell you that fact. One word more in reference to preparing simple syrup. By using heat you can make a syrup in a half an hour, and with the cold process it will take from three to four hours, which, under all circumstances, is a waste of time that speaks decidedly in favor of the officinal process. The other officinal syrups are prepared in like manner by the cold process. It is necessary to obtain a menstruum as laid down in the Pharmacopœia, and this is poured upon the sugar as directed with the simple syrup.

I will now consider the officinal *syrup of orange-peel*, which is an inferior preparation. And why? Because if heat is used, and it should be used carelessly, then the result will be that the heat will destroy the delicate flavor for which this syrup is noted. On this point the advocates of the cold process and myself agree; but we differ in regard to the change of formula which is necessary. They want a concentrated tincture of 8 troyounces of orange-peel to a pint in the strength of 3 parts of alcohol to 1 part of water. This tincture is to be triturated with magnesium carbonate and some sugar, gradually adding water, then filter with sufficient water to make it measure 16 fluidounces. This filtrate shall be used upon the sugar as directed by the cold process. My process,

on the other hand, is as follows: Take of orange-peel ℥xvi , macerate for 3 or 4 days with one pint diluted alcohol, then place in a percolator and add sufficient dilute alcohol to obtain two pints of tincture. Take 2 ounces of this concentrated tincture to 14 fluidounces of simple syrup made by heat, and you have a syrup which is of officinal strength. This syrup has lost none of its fragrant volatile principle, and stands without a peer. It is claimed that, according to this formula, this syrup will become turbid. I must say that I have had this syrup for a period of three months already, and I never noticed any turbidity. It is also claimed that the magnesia used in the other formula dissolves the resinous matter and makes a clear syrup. To this I will say that by dissolving this resinous matter you are changing the character of the syrup, for this resinous matter is the bitter tonic principle for which the syrup is occasionally prescribed. On the other hand, by using magnesia you cannot have all the volatile principle in the syrup, for it is a known fact that all volatile principles are taken up to some extent by the magnesium carbonate.

In order to improve the appearance of the *syrup of rhubarb*, it has been suggested to add 20 grains of carbonate of potassium to the fluid extract before adding the simple syrup made by the cold process. It is claimed that the potassa will dissolve the resinous matter of the extract, and the syrup will be a clear and highly-colored syrup. By doing this, you must call this syrup a *compound* syrup of rhubarb, because the addition of this alkali will change the character of the syrup and neutralize the chrysophanic acid of the rhubarb, which is not desirable in every instance where rhubarb is prescribed; for the physician may not want an alkali, and certainly everyone must admit that the druggist has no means of knowing whether he can add an alkali or not without directions by the physician.

There are other minor points which speak against the cold process, but even the officinal process in some syrups is inferior, and therefore we ought to have some changes in the officinal syrups, be it either by heat, cold percolation or any other mode of procedure, with the exception that if the cold process is adopted as officinal, it must be radically changed from its present mode, as advocated by its friends and supporters.

OFFICIAL OR OFFICINAL?

BY F. MARION MURRAY, M.D.

"There is a defect in the first make of some men's minds, which can scarce ever be corrected afterwards, either by learning or age."—Burnet.

We are loth to suddenly part company with old friends, be they human, trophies, theories or words that may have become endeared to us by association or usage, yet this tie should never be so strong as to lead to the prejudicial side. Whatever is correct should be adopted and used, even though its discovery was not given to the fathers, but left to the sons. The adoption of *official* will be doing a justice to our language by giving to the word its rightful place, so long falsely occupied by *officinal*.

The term *officinal* is in favor with many because of its long usage; no thought being taken of its correctness or incorrectness.

No doubt the botanical use of *officinal* as a specific name for plants used in medicine, as, *Althæa officinalis*, *Zingiber officinale*, etc., has been one of the chief means of giving the word its prominence with the medical and pharmacal fraternities, but in giving specific names to plants already much used, and to be had in the apothecaries' shops, botanists meant merely that the particular *Althæa* or *Zingiber* should thereafter be known, for distinction only, as the species "of the shops," or *officinal*, the word having no reference to authority. Now, medicines that are recommended to be used by such bodies as the National Pharmacopœial Convention, British Council, etc., are *official*—given under authority—in the countries over which they have jurisdiction.

It is true that both words are derived from the same root, but *officinal* is the older, coming to us directly from the Latin *officina*, a shop; while *official*, the younger, comes to us through the French *officiel*.

"An *official* formula is one given under authority. An *officinal* formula is one made in obedience to the customary usage of the shop (*officina*). To state that any preparation under the sanction of the Pharmacopœia is *officinal*, is a misapprehension of the meaning of the word."—Brough.

"The Pharmacopœia and all in it are *official* (*office*, Fr. from L. *officium*, an office). There are many things which, in pharmacy, are *officinal* (Fr. from L. *officina*, a shop) but not *official*. To restrict the

word *officinal* to the contents of a pharmacist's shop, and to that portion of the contents which is pharmacopœial, is radically wrong, and should be avoided."—Note to "Attfield's Chemistry," 5th Ed., p. 25.

It has been objected that the "innovation," as it is called,¹ has nowhere received support. In refutation of this I note that it has already been adopted by Prof. Attfield, in his "Chemistry;" Mr. Squire, in his "Companion to the British Pharmacopœia;" Mr. Wills—the most successful teacher of preliminary pharmacy in England—in the Westminster College of Chemistry and Pharmacy, and in our own country by the U. S. Marine Hospital Service. This ought surely to be authority sufficient to warrant the luke-warm in deciding in its favor, since the outlook is so bright.

Official has another advantage; it is one syllable shorter than the old word.

The objection that the word is new cannot obtain, because it long has been, and is in daily use in governmental circles. It is only taking a new direction.

The customary use of the term *unofficinal* is radically wrong,—its true meaning being that anything that is unofficinal is not to be had in the shops; while many articles that have never been accredited a place in any Pharmacopœia, and others that have been expunged, are constantly kept on sale in the shops. This ambiguity will cease to exist with the adoption of the term *unofficial*, which has but one meaning in medicine: not recognized by a national authority.

In view of all this, I beg authors that are about to issue books that may be used as authority, and the Pharmacopœial Convention of the Sixth Revision, to note the term and adopt it, thereby accepting the inevitable.

I hope we may not be given an opportunity to say, with Job, "They have refused to receive correction."

Philadelphia, Eighth mo. 20th, 1878.

REMARKS BY THE EDITOR.—It will be noticed that the arguments advanced by Dr. Murray in favor of the change present nothing new,

¹ See article by Dr. A. W. Miller, on "Official and Officinal," "Amer. Jour. Phar.," April, 1875.

except that, *since* the publication of Dr. Miller's paper, in 1875, it had been adopted by several writers, which certainly cannot be called a refutation of his statement then made. We acknowledge the desirability of having a single term expressive of the fact that a medicine is recognized by the Pharmacopœia; but we doubt the propriety and correctness of the term "official," even at the risk of being classed with those "in the first make of whose minds there is a defect." Medicines which are regularly furnished according to the official supply table of the army and navy, may, perhaps, be called *official* medicines, even though not recognized by the Pharmacopœia; are they *unofficial*, if not mentioned in the supply table, but recognized (or not) by the Pharmacopœia, and furnished upon special *official* requisition?

In every language there are certain terms which, on close analysis, are more or less ambiguous, but which are sanctioned by usage. What the chemist designates as *water* is not what is popularly known or recognized as such by our Pharmacopœia. The *albumen* of the botanist and of the chemist are two entirely different substances, and an aqueous solution of the one is likewise known by the same name. The terms *neutral* and, as occasionally still employed, *saturated*, are of a similar character, and examples might be considerably multiplied. In our opinion it is better to adhere to a well understood, though ambiguous term, instead of changing it for another, as we believe, equally ambiguous one, about the greater correctness of which grave doubts are still entertained.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Purification of Chloroform and the Presence of Amylic Alcohol in it.—Hermann Werner purifies commercial chloroform (made from alcohol) by mixing it with quarter its bulk of distilled water, shaking occasionally, withdrawing the water on the following day, and removing the HCl or water which may be present by macerating for 24 hours with sodium carbonate, previously heated to redness. After separating from the soda, the chloroform to be used for anæsthetic purposes is distilled on a water-bath at a temperature not exceeding 64°C.; the portion distilling at a higher heat is only used externally. The first portion of the distillate has the lowest specific gravity and is

turbid, but immediately becomes clear when shaken with a small quantity of sodium carbonate, previously heated to redness.

While purifying 5 kilos of chloroform, Werner continued the distillation until 90 grams remained in the retort, which gradually separated yellow, small drops, possessing the characteristic odor of fusel oil. On carefully distilling this residue the boiling point remained constant at 62°C. until only 4 or 5 grams were left, when it quickly rose to 66°C. The residue, on being now treated with sulphuric acid and potassium bichromate, yielded valeric acid.—*Archiv d. Pharm.*, June, 1878, p. 481.

Adulteration of Etherial Oils.—Leonhardi considers the usual test for adulteration with alcohol, which consists of mixing the suspected oil in a graduated-tube with water, and then observing the increase or decrease in bulk of the latter, reliable, but objectionable and undesirable for expensive oils on account of the unavoidable waste of the latter. He prefers the anilin test, which is applied by dropping a little of the suspected oil on a crystal of anilin-red, when the presence of alcohol is immediately indicated by a red coloration. The following adulterations were noticed by Leonhardi, who found the tests mentioned in connection with them reliable :

Fennel oil stearopten is imported from Russia for adulterating *oil of anise*, often to the extent of 90 per cent., because it likewise solidifies at a low temperature ; it develops, however, a very characteristic odor of fennel, when heated, which easily betrays the adulteration.

Oil of coriander is extensively adulterated with colorless rectified oil of orange, which can be detected by its insolubility in 90 per cent. alcohol, in which pure coriander oil dissolves in every proportion ; equal parts of oil of orange and 90 per cent. alcohol makes a turbid mixture.

Oil of bergamot is adulterated with oil of orange ; the insolubility of oil of orange and the solubility of oil of bergamot in 90 per cent. alcohol also furnish a method of detection in this case.

Oil of caraway is often mixed with oil of caraway-chaff, which again is adulterated with oil of turpentine. Pure oil of caraway dissolves in 90 per cent. alcohol, while it forms a cloudy mixture if adulterated with turpentine. The behavior to iodine and the odor are often sufficient to prove the adulteration.

An American oil of peppermint, which has obtained about half a dozen of World's Exhibition prize-medals, and is sold in blue bottles holding 750 grams, was tested by the author. Iodine produced no red vapors and anilin-red no coloration; oil of turpentine and alcohol were therefore absent; 90 per cent. alcohol made a cloudy solution, while genuine English oil dissolves clear in every proportion. When mixed with equal parts of H_2SO_4 , a dark-red coloration was produced, which remained on the addition of alcohol, while English oil causes a brown coloration. After comparing the American oil with different samples of European oils, the author came to the conclusion that the former was adulterated with rectified oil of sassafras.¹—*Ibid.*, June, 1878, p. 490.

Oil of *Thymus Serpyllum*, *Lin.*, was by Dr. E. Buri subjected to fractional distillation and collected in 4 portions, boiling respectively at about 180° , 204° , 220° and $350^\circ F$. On agitating these fractions with water, acetic and another acid was taken up, the mixture of the two having an odor resembling that of butyric acid. None of the fractions yielded a crystalline compound with bisulphite of potassium. By agitation with potassa solution, and treating the latter with ether, both before and after acidulating it, two phenols were obtained, that from the alkaline liquid being about 3 per cent. of the weight of the oil, colorless; colored ferric chloride yellowish-green and yielded with sulphuric acid a sulphonic acid, the salts of which gave with ferric chloride an intense blue color, like that produced by thymol sulphonates.

The phenol of *oleum serpylli* resembles thymol, but differs from it in the following respects:

1. Its solution in diluted alcohol turns green with iron chloride, while thymol causes no noticeable coloration.
2. The phenol of *oleum serpylli* does not congeal at $-10^\circ C$., while thymol often remains liquid at a moderate temperature, but solidifies at $0^\circ C$.
3. The potassium salt of the sulpho-acid is amorphous in the case of *serpyllum*, while that of thymol crystallizes easily.

Prof. Fliickiger adds that thus far *thymol* has been obtained only from

¹ Owing to the high specific gravity of oil of sassafras, we doubt its being used for adulterating oil of peppermint. The latter, if of American origin, frequently contains the oil of *Erigeron canadense*, a weed, which always establishes itself in American peppermint plantations.—EDITOR AM. JOUR. PHAR.

the volatile oils of the following plants: 1, *Thymus vulgaris*, *Lin.*, by Caspar Neumann, in 1735, as "camphora thymi"; 2, *Monarda didyma*, *Lin.*, by Brunn, in 1796, as a crystalline deposit; 3, *Monarda punctata*, *Lin.*; its thymol was described by Arppe in 1846; 4, Doveri (1847) and Lallemand (1853) examined the crystalline part of oil of thyme, which was called thymol by the latter; 5, *Ammi copticum*, *Lin.* (*Ptychotis ajowan*, D. C., and *Ptych. coptica*, D. C.); the thymol was prepared by Stenhouse (1855) and Haines (1856), and its identity with thymol proven by Hugo Müller (1869).—*Archiv d. Phar.*, June, p. 485-489.

VARIETIES.

Polymnia uvedalia. By J. A. G. Clowes, M. D.—The success attending the treatment of malarial diseases, especially where the spleen is involved, sometimes exceeds the comprehension of some of the most learned in the medical profession. A case recently treated with the Bearsfoot, I thought would prove interesting to the readers of the "Reporter." Some three weeks ago I was consulted by Newton M., aged twenty-five, who complained of pain in the region and over the seat of the spleen, and upon examination I found tenderness, with marked enlargement of the organ. Upon questioning him, he gave a history of a series of attacks of intermittent fever about a year previous to consulting me. Thinking this would be a good case to test the merits of the Bearsfoot, I accordingly prepared an ointment after the following formula:

R	Fl. ext. polymniæ uvedaliæ,	℥ii
	Adipis,	℥i M.

and directed that it should be applied twice daily. I also gave, as an internal medicine, a mixture of

Wine of pepsin,	℥iii
Mur. acid,	℥ss
Syr. simp.,	℥i M.

Dose—Teaspoonful after meals.

One week later my patient returned, saying that his side was much better, and that the pain had changed. He, moreover, complained of headache, for which I gave small doses of morph. sulph., and advised the continued use of the uvedalia ung., as I was anxious to know something of the result of the vaunted cures by the uvedalia, and in less than a week he again returned, saying that the pain and soreness had entirely disappeared. It has now been over a week since he has felt anything of the pain. From the limited experience I have had with polymnia uvedalia in the form of an ointment for chronic rheumatism it has given very good satisfaction. It relieves the pain incident to that disease, and gives better use to the joints than any application in the form of an ointment that I have used.—*Med. and Surg. Rep.*, March 16.

Cantharidin and an Acid Derivative thereof. By J. Piccard.—Three determinations of the vapor-density of cantharidin gave the numbers 6.36, 6.60 and 6.41; the empirical formula of this body is therefore $C_{10}H_{12}O_4$. It enters into complete fusion at $218^\circ C.$, and not at 250° , as usually stated.

By the action of hydriodic acid at a temperature of 100° in sealed tubes it is converted into a body, which, although possessing the same ultimate composition, differs essentially from catharidin. It crystallizes in needles, which melt at 278° , and are soluble in 12 parts boiling water; they are freely soluble in alcohol, slightly in ether, and insoluble in benzene. The solution of this body in glycerin does not blister the skin.

In its chemical properties it differs from cantharidin in being a strong acid, dissolving in and completely neutralizing alkaline solutions, decomposing carbonates with effervescence, and being but partially expelled from its salts by acetic acid. The salts of *cantharic acid*, as this body is termed by the author, contain 1 atom of metal to 10 atoms of carbon; the union of the acid with bases is attended with the elimination of H_2O ; it is therefore a monobasic hydrate; its equivalent, as determined by titration (cryst. oxalic acid = 63) is 196.

The general formula of its alkaline salts is $C_{10}H_{11}O_3 \cdot OR'$. The lead salt crystallizes in long needles. Its formula is $(C_{10}H_{11}O_4)_2Pb$.—*Jour. Chem. Soc.* [Lond.], March, 1878, from *Deut. Chem. Ges. Ber.*, x, 1504—1506.

Certain Reactions of Chloral. By O. Wallach.—In extension of his investigation of the decomposition of chloral by potassium cyanide, the author finds that by the action of the more complicated cyanides upon this body, dichloroacetic acid is likewise formed. In the case of potassium ferrocyanide, the formation of this acid is explained by the equation $2FeCy_6K_4 + 3[C_2Cl_3OH + H_2O] = 3CCl_2HCO_2K + 3KCl + 2FeCy_3K + 6CNH$. The resolution of chloralcyanhydrate into chloral and an alkaline cyanide, by the alkalis, results in the formation of dichloroacetic acid, as a consequence of the mutual reaction of the immediate products of decomposition, thus:



The above reactions are applied by the author to the production of dichloroacetic ether, for which the necessary details are given. By heating chloralcyanhydrate with alcohol for some hours at $180^\circ C.$, dichloroacetic ether is formed; the decomposition of chloralcyanhydrate into dichloroacetic acid takes place, therefore, independently of the alkalis.

The action of the cyanides upon butyl-chloral the author finds to be entirely analogous to that already described. Dichlorobutyric acid appears to be formed according to the equation $C_4Cl_3H_5O + CNK + H_2O = C_4Cl_2H_6O_2 + KCl + CNH$, but owing to its instability passes at once into monochlorocrotonic acid. This reaction may be advantageously applied to the production of the latter acid.

That water plays a double part in decompositions of this nature, viz., of simultaneous oxidation and reduction by means of its elements, appears to be the only possible explanation of its action. The author is of opinion that the formation of

mono- in place of a dichloroacetanilide, by the action of anilin acetate upon chloroacetyl cyanide, which was observed by Pinner, may be referred to a reduction by means of hydrogen which has been liberated from water formed in the course of the reaction.—*Jour. Chem. Soc. [Lond.]*, April, 1878, from *Deut. Chem. Ges. Ber.*, x, 1525-1530.

A Process for Preparing Formic Acid. By V. Merz and J. Tiberica.—Sodium formate can be prepared by passing a stream of carbon monoxide over soda-lime heated in an oil-bath to a temperature between 200° and 250°C. The absorption of carbon monoxide by soda-lime may be used as a lecture experiment to demonstrate the formation of organic compounds from inorganic materials, and it might be employed for manufacturing formic acid should a large demand for this acid ever arise.—*Ibid.*, from *Ibid.*, x, 2117.

Action of Alcoholic Potassa on Chloroform. By M. Berthelot.—By acting on a solution of chloroform in absolute alcohol, with alcoholic potassa, the author has obtained results which show that for the complete decomposition of 1 equivalent of chloroform, between 2 and 3 equivalents of potassa are sufficient, instead of 4 equivalents, as required by theory. From this and from the fact that a portion of the chlorine does not enter into combination with the potassium, he thinks it probable that a tribasic formic ether is produced, together with a chlorinated compound.—*Ibid.*, from *Bull. Soc. Chim. [2]*, xxix, 4-6.

Juglone (Nucin). By C. Reischauer.—This body, prepared from the green shells of walnuts (*Juglans regia*), has been analyzed by the author, who assigns to it the empirical formula $C_{26}H_{12}O_{10}$.

A compound of this body with copper is obtained by adding its alcoholic solution to a solution of neutral cupric acetate either in water or alcohol. It occurs in small bronze-colored shining crystals, and after drying at 100° contains 15.83 per cent. Cu. Sufficient data are not yet at hand for the determination of the constitution of these compounds.

This paper also contains details of certain modifications of the ordinary method of combustion which had to be adopted in the analysis of juglone, in consequence of its volatility.—*Ibid.*, March, 1878, from *Deut. Chem. Ges. Ber.*, x, 1542-1548.

Chemical Compounds contained in Liquid Storax. By Wilhelm v. Miller.—The results of the author's researches contained in the second part of the paper (too long for abstraction) show that, in addition to styrolene, cinnamic acid and styracin, storax contains—

- (1.) *Phenylpropyl cinnamate* in considerable quantities.
- (2.) *Ethyl cinnamate* in small quantities.
- (3.) A body which smells like *vanillin*, and forms a crystalline compound with sodium bisulphite. This body melts at 65°, and may possibly be ethylvanillin. It occurs in small quantities.

(4.) A resinous body which accompanies the last in small quantities. Its composition has not been determined.

(5.) Two alcoholic bodies (α - and β -storesin) in very considerable quantities.

(6.) Compounds of these bodies with cinnamic acid also in considerable quantities.

(7.) A sodium compound of storesin in very small quantities.

Storesin (from *Storax* and *resina*) is the name proposed by the author for the body obtained from the residue left on extracting refined storax successively with caustic soda, cold alcohol, cold petroleum naphtha, hot petroleum naphtha (using an upright condenser). It melts between 160° and 168°C. , and has the composition $\text{C}_{36}\text{H}_{58}\text{O}_3$.—*Ibid.*, February, 1878, from *Liebig's Annalen*, clxxxviii, 184—216.

Alkaloids contained in the Red Poppy. By O. Hesse.—The milk-sap of the unripe capsules of *Papaver Rhæas* leaves on evaporation about 34 per cent. of dry residue, which the author finds to contain no trace of morphia, or any similar alkaloid. The residue contains 2.1 per cent. of rhæadina, and traces of other, partially crystallizable alkaloids.—*Ibid.*, February, 1878, from *Liebig's Annalen*, clxxxv, 329.

Veratria. By E. Schmidt.—This alkaloid has been carefully examined by Merk (*Ann. Chem. Phys.*, xcv, 200), who ascribed to it the formula, $\text{C}_{32}\text{H}_{52}\text{N}_2\text{O}_8$, and by Weigelin (*Jahrb. f. Fortschr. Pharm.*, 1871, 28), who assigned to it the very different formula $\text{C}_{32}\text{H}_{86}\text{N}_2\text{O}_{15}$. It has been, therefore, re-examined by Schmidt, who obtained 56 grams from 5 kilos. of the seed of the *Veratrum sabadilla*, by exhausting them with very dilute sulphuric acid, and precipitating the crude base from the concentrated solution by ammonia. It was purified by dissolving it in ether, and repeated precipitation from its solution in hydrochloric acid by ammonia. Crude or commercial veratria appears to contain three modifications—namely, a crystalline base insoluble in water, an amorphous resinous base also insoluble in water, and an amorphous base which is soluble in water. Schmidt thinks this last is formed from the second during the process of separation. The commercial veratria is soluble in ether and alcohol, but nearly insoluble in water, and melts at 155°C. The crystalline modification appears to be the principal constituent, or to be veratria proper.

Veratria crystallizes from dilute alcohol in compact groups of short needles, which are readily soluble in alcohol and insoluble in water. They melt at 205° , or considerably higher than commercial veratria. From nine analyses, Schmidt deduces the formula $\text{C}_{32}\text{H}_{50}\text{NO}_9$, and he points out that this formula agrees with the analytical numbers obtained by Weigelin and Merk, with the exception of the single determination of the amount of nitrogen which the latter made. The *sulphate*, $(\text{C}_{32}\text{H}_{50}\text{NO}_9)_2 \cdot \text{H}_2\text{SO}_4$, forms an amorphous mass, readily soluble in water, and the *hydrochlorate*, $\text{C}_{32}\text{H}_{50}\text{NO}_9 \cdot \text{HCl}$, is a very similar body; neither of them is crystalline, as stated by Couerbe (*Ann. du Chem.*, 9, 112). The double *gold salt*, $\text{C}_{32}\text{H}_{50}\text{NO}_9 \cdot \text{HCl} + \text{AuCl}_3$, consists of a bulky yellow precipitate, soluble in hot

alcohol. The *platinochloride*, $2(C_{32}H_{50}NO_9 \cdot HCl) \cdot PtCl_4$, is a similar bulky amorphous yellow precipitate, easily soluble in alcohol, less soluble in water, and insoluble in ether. The *mercuric* compound, $C_{32}H_{50}NO_9 \cdot HCl + HgCl_2$, is a white crystalline precipitate, soluble with comparative facility in water, readily soluble in alcohol, but insoluble in ether.

The two other modifications of veratria appear from the results of the analysis to have the same formula as that of crystalline veratria, and their platinum salts are of similar character and constitution. All these, are, therefore, isomeric, but their difference in constitution has not yet been ascertained.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], x, 511—532.

Curarina. By T. Sachs.—According to the author's investigations, curare is soluble to the extent of 75 per cent. in cold water. The curarina contained in it is in combination with sulphuric acid, not with acetic acid, as stated by Roulin and Boussingault. The formula of curarina, as deduced from analysis of the picrate, is $C_{18}H_{35}N$. Curarina hydrochloride and sulphate are both very unstable, and not crystallizable. Solution of curarina acetate gives with *sodium chloroplatinate* a bulky yellowish-white precipitate of the formula $2(C_{18}H_{35}N \cdot HCl) + PtCl_4$, which speedily decomposes, assuming a violet color. The acetate gives precipitates also with *potassium and mercury iodide, potassium and cadmium iodide, potassium cyanoplatinite, potassium chloroplatinite, gold chloride, tannin, picric acid, potassium and mercury chloride, sodium phosphate, sodium arsenate, potassium iodate, potassium thiocyanate, and potassium ferrocyanide and ferricyanide.*

Preyer's statements with regard to curarina (*Zeitschr. f. Chem.*, viii, 381) are, to a great extent, erroneous. A specimen of Preyer's "curarina sulphate," examined by the author, was found to consist mainly of calcium phosphate and carbonate.—*Ibid.*, June 1878, from *Liebig's Annalen*, cxcii, 254—260.

The Action of Phosphoric Acid on Calcium Carbonate. By H. Ritthausen.—An aqueous solution of phosphoric acid acts on precipitated chalk, forming small needle-shaped crystals of di-calcium phosphate, $Ca_2H_2P_2O_8$; the tri-phosphate is never formed. The crystalline character of the phosphate renders it possible to detect very small quantities of this substance, even in presence of a large excess of calcium carbonate, by means of the microscope. The finely-divided chalk contained in marl deposited in the beds of streams or ponds is easily attacked by phosphoric acid. Dense particles of calcium carbonate in marl, which are scarcely acted on by phosphoric acid, are converted into di-calcium phosphate by the simultaneous action of carbonic and phosphoric acids.—*Ibid.*, March, 1878, from *Land. Versuchs-Stat.*, xx, 401—407.

The Behavior of Iodine to Amido-mercuric Chloride, in Presence of Alcohol; and a Safe Method of Preparing Iodide of Nitrogen. By R. Böttger.—Although iodine may be ground in a mortar along with amido-mercuric chloride, with no

other action than the formation of mercuric iodide, yet in presence of alcohol an explosion always takes place in 30 or 40 minutes, preceded by evolution of nitrogen, and sometimes separation of mercuric chloride. In presence of chloroform or amyl-alcohol, gas is evolved, but no explosion occurs.

The author's process for preparing nitrogen iodide consists in treating a solution of iodine chloride, obtained by heating iodine with nitro-hydrochloric acid with ammonia. Thus prepared, it never explodes when moist, and when dry only when touched with a piece of wood, or some similar substance.—*Ibid.*, from *Chem. Centr.*, 1877, p. 651.

Is the Decolorizing Power of Animal Charcoal due to the Carbon or to Porosity? By F. Jicinsky.—No direct answer is given to the question. The author states that during filtration (of sugar) the organic matters of the syrup, especially the coloring matters, and also the mineral salts, are absorbed by the surface attraction. The lime is withdrawn from the syrup chiefly as calcium hydrate, and partly also as carbonate. In the process of purification the reverse takes place to a certain extent as regards the salts. These are taken away again from the carbon by the water.

In the renovation of the charcoal, the calcium hydrate and carbonate are removed by the acid, and the sugar, together with absorbed organic matters, yields on fermentation first lactic and then butyric acid, thus reducing the complex organic matters to simple compounds. By the action of these acids a part of the lime is converted into the calcium salts of the fatty acids, and these again are converted on heating into calcium carbonate, and the porosity is restored. The fermentation is much more important than the heating.—*Ibid.*, April, 1878, from *Ibid.*, p. 138.

A New Ether of Glycerin. By Christian Götting.—The salicylic ether of glycerin is prepared by dissolving salicylic acid in glycerin and passing hydrochloric acid gas through this solution heated to 100°C. The ether so obtained is purified, after washing, by distilling under reduced pressure, as it decomposes when distilled under the ordinary pressure. It is a colorless and odorless liquid, soluble in alcohol, ether and carbon disulphide. Analysis shows it to have the formula—



The author supposes that the hydrochloric acid acts so as to form first the monochlorhydrin of glycerin, and not salicyl chloride.—*Ibid.*, from *Deut. Chem. Ges. Ber.*, x, 1817-1819.

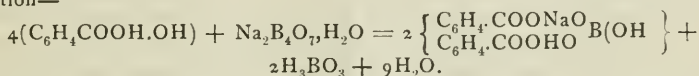
On Sodium Compounds of Salicylic Acid. By E. Hofmann.—If a solution of sodium salicylate containing free salicylic acid be kept for some time, large clear hard crystals separate. These become opaque on the addition of water, being converted into pseudomorphs of salicylic acid. They appear to be an acid sodium salicylate, $\text{C}_7\text{H}_5\text{O}_3\text{Na} + \text{C}_7\text{H}_6\text{O}_3$, which by water are resolved into sodium salicylate and free salicylic acid. They are, however, soluble without decomposi-

tion in alcohol, and may easily be prepared by evaporating an alcoholic solution of the acid and the sodium salt. The corresponding potassium, lithium, and ammonium compounds have been prepared.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], xii, 226—229.

Behavior of Borax to Salicylic Acid and of Boric Acid to Salicylates. By E. Jahns.—It appears that the solution of salicylic acid in borax solution is no simple solution, but contains a compound, which can be crystallized from its solutions, and has the composition $C_{14}H_{10}O_5NaBO_2$. If 4 mols. of salicylic acid are dissolved in a boiling solution, containing 1 mol. of borax in about 5 parts of water, the solution on cooling first deposits boric acid unaltered, and then the compound



analogous to the borotartrate. The reaction therefore takes place according to the equation—



Free borosalicylic acid has not as yet been obtained, but several of its salts are described, and the analogies between borosalicylic and borotartronic acids are pointed out.—*Ibid.*, June, 1878, from *Arch. Pharm.* [3], xii, 212—226.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—Since our last issue the yellow fever, which had made its appearance at New Orleans, has extended its ravages up the Mississippi valley, and isolated cases have appeared in the Ohio valley, in several ports on the Atlantic coast, and a few inland cities, carried there by inhabitants of the infected localities and by vessels coming from ports where the fever had gained a foothold. Up to the time of writing this the Southern Atlantic ports and the Southern States generally, with the exception of the Mississippi Valley, have been free not only from epidemic yellow fever, but also from other diseases; and the location of Atlanta, and its general salubrity, is such that it may be visited at any time without fear of oppressive heat or climatic disease. Yet, after the circulars announcing the meeting for September 3d had been issued, the officers and Executive Committee were urged to such an extent in favor of postponing the meeting to a later date, that it was deemed prudent not to risk the threatened danger of failure from the causes which are explained in the following circular: .

“Potts-ville, Pa., August 23d, 1878.

“Guided by the advice and with the approval of the officers of the Association and of the pharmacutists and druggists of Georgia, the Executive Committee

announce that the Twenty-sixth Annual Meeting has been POSTPONED until some time in November.

"From all the information in their possession the Executive Committee are still of the opinion that, at the time originally fixed for the meeting, Atlanta, Ga., would be as safe a place to visit as could well be selected. However, the spreading of yellow fever in the Mississippi Valley will keep many pharmacutists at their posts, not only in the infected districts, but likewise in more distant localities; and an unnecessary alarm spread further North would very materially reduce the number of visitors from that section. On the other hand, it is of paramount importance that the meeting at Atlanta be well attended from Georgia and the neighboring States, as well as from those East and West.

"As soon as the necessary arrangements can be completed, the precise time at which the meeting will be held, will be announced by the President; and in due time the Secretary will issue notices, giving particulars. Members intending to attend the meeting will oblige the Secretary by notifying him.

"G. W. KENNEDY, *Chairman Ex. Committee, Pottsville, Pa.*

"JOHN M. MAISCH, *Permanent Secretary, 145 North 10th St., Phila.*"

This is the second time in the history of the Association that such a course has been deemed necessary. The cause which led to the postponement, for a whole year, of the meeting which was to be held in 1861, will, we trust, never again make itself felt; the cause for this year's postponement *may* again occur; and we think it is mainly the fear of climatic diseases, prevailing at the time when the meetings of the Association have been held, which has deterred the members from meeting, ere now, as far south. There can be no question that the time has arrived when it would be good policy for the Association to extend its influence beyond the localities where it has been wont to meet; and the apparent difficulties which have hitherto operated against holding meetings at such places are by no means insurmountable. We are pleased to state that quite a number of members have already notified the Secretary of their intention of going to Atlanta.

New York College of Pharmacy.—The building purchased by this institution, as we announced in our March number (p. 140), has been completely renovated, and is ready for the accommodation of the class at the ensuing lecture term. It is located at 209 and 211 East Twenty-third street, and contains a handsome and large lecture room and a well-fitted laboratory, more roomy and convenient than the former one.

The Maine Pharmaceutical Association held its annual meeting July 21st, in the city of Portland. About noon the entire company marched from Reception Hall to Portland Pier and embarked on the steamer *Meta* for Harpswell, where they took dinner, and, after a number of toasts had been responded to, enjoyed themselves until late in the afternoon, when they returned to the city, where the meeting was held in the evening, Vice-President A. G. Schlotterbeck presiding, in the absence of President Partridge. New members were elected, the various officers and committees made their reports, and the following officers were elected to serve for the ensuing year: President, C. A. White, Gardiner; Vice-President, E. Dana, Jr., Portland; Secretary and Treasurer, Edward Merrill, Rockland; Auditor, S. Anderson, Jr., Bath.

Pittsburg College of Pharmacy.—We learn that the pharmacists and druggists of Pittsburg are considering the advisability of forming an association, with the view of establishing a course of lectures for the education of young pharmacists. A preliminary organization of the society has already been effected.

Philadelphia College of Pharmacy.—The London "Pharmaceutical Journal" of August 10th, in an article on the Paris Exhibition, says: "By far the finest collection of crude drugs in this department is that exhibited by the Philadelphia College of Pharmacy, which appears to include all the crude drugs used in the States, either by allopaths, homœopaths or eclectics, and is perhaps the most perfect of its kind in the exhibition."

Large and very valuable collections of foreign drugs for the museum of the college, have either arrived or are on the way to this country.

EDITORIAL DEPARTMENT.

Sapo Viridis.—Mr. H. Betz informs us that in the paper on green soap, published on page 66 of the February number, he omitted to state that the solution of potassa used by him contained 10 per cent. of the alkali; and that he considers such a solution strong enough to effect, with an equal measure of linseed oil, perfect saponification, the product being uniform and transparent.

Improved Education of Pharmacists.—The "Medical and Surgical Reporter" of July 6th contains an editorial under the above caption, which we produce below without comments, since all the shortcomings of pharmacists mentioned have been repeatedly discussed in this journal. There are, however, several "vexed subjects" upon which the editorial article does not touch, and which, in our opinion, are quite as important, if not more so, than the sale, by pharmacists, of so-called patent medicines, or of cathartic pills, oil of cloves, cold cream, and numerous other remedies well known to the public. While we frankly acknowledge that there is much room for improvement in the practice of pharmacy, we believe that the same is true also in the practice of medicine, since physicians often advocate the use of semi-proprietary and copyrighted medicines, of the composition of which they know no more than the manufacturer chooses to tell them.

"The Board of Trustees of the College of Pharmacy, of Philadelphia, have decided upon a junior and senior course of study. The junior students will have to pass an examination in all the branches before they can enter the senior class, and the instruction given to the senior class will include a wider range of scientific subjects than it has been possible to give heretofore. This system will go into effect in October. This is as it should be, and we have no doubt will prove a successful move.

"It is high time that the vocations of the pharmacist and the physician be recognized as two wholly and distinct careers. The doctor is yet, in many places, physician and apothecary in one, and the saddlebag system of dispensing medicine and advice has done the pioneer work in many a now thronged and prosperous locality. It was indispensable; it may be so yet, on the frontiers; but when not necessary, the custom should be discountenanced. Pharmacy is too complicated, too delicate, too difficult a science to be made any longer an appendage to a medical education, or to be taught in any other than a superficial manner in medical schools. Pharmaceutists should be men highly trained and specially given to their delicate and responsible work; for more delicate or careful work than the compounding of prescriptions can hardly be named; the apothecaries bear the people's lives in their hands, and the subject is one of real consequence to every person.

"The physicians of this country are called upon to encourage the separation of the two vocations, in their own interest. They cannot, indeed, do away with the 'counter prescribing' of the apothecary. Accidents and cases of sudden illness are brought to him, and while the physician may be at once summoned, it is still necessary, at least it is desirable, that the apothecary should be able to take the place of the doctor for the time, and do the needful professional offices.

"It has come to this, indeed, that the apothecary has indirectly a large amount of practice. People drop in upon him for all kinds of medical advice, and in thousands of cases apothecaries have a degree of trust reposed in them which is not proper, unless the party is a man of exceptional intelligence and education. Nor is this the case only in villages and sparsely populated neighborhoods; in such sections the practice thrives through the inability, at all times, of easily securing a physician; while in the cities it is almost equally common through accidents, and through the poverty of many persons who cannot consult a doctor, and yet are too proud to apply to the dispensaries. From one reason or another, it is known that apothecaries have a great deal of 'practice,' and it is a state of things not easily to be remedied. Nevertheless, we believe that an amicable understanding on this vexed subject is possible, and can be effected in any given locality by arrangement between the leading persons interested.

"Another frequent and just cause of complaint by the physicians is that druggists injure the community by selling harmful patent medicines. The pharmacists in England have themselves taken steps in this matter. At one of their recent conventions the importance was urged of fixing some legal limit to the wholesale poisoning of the public by patent medicines. It was proposed that, even if it be impossible altogether to suppress the reaction of dishonest quackery upon vulgar superstition, the venders of nostrums be compelled to divulge the composition of their wares, and prevented from publishing mischievous and mendacious advertisements concerning them. Among the examples cited, including sundry 'hair restorers,' which, in direct contradiction of their advertised pretensions, contain poisonous quantities of lead, the most glaring one is a largely certificated 'Sure Cure for the Opium Habit,' which is found, on analysis, to give two grains of morphia to the dose, recommended to be taken thrice a day.

"It is scarcely to be expected that American apothecaries, most of whom derive a large part of their income from the sale of these secret nostrums, will join in this movement at once, but it would be well if the American public were taught that ninety-nine hundredths of the proprietary medicines that flood the market are the products of uneducated imposters, and are either wholly inert or positively deleterious. Some steps in this direction have already been taken by the National Pharmaceutical Association. With further elevation in the education of pharmacists, most of them will acknowledge the utility of such a movement."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Annual Reports of the Super-vising Surgeon-General of the Marine-Hospital Service of the United States for the fiscal years 1876 and 1877. John M. Woodworth, M.D. Washington: Government Printing Office. 1878. 8vo, pp. 213.

As in former years, the report of Surgeon-General Woodworth contains an account of the operations of the Marine-Hospital Service, and statistics relating to the finances and economic exhibit, as well as to the medical and surgical service performed. The appendix contains, as usual, a number of valuable papers. The most important for pharmacists is one by Professor Oscar Oldberg, entitled "Metric weights and measures for medical and pharmacal purposes," in which the advantages of the metric system are very clearly set forth, and which has led to its adoption by the Marine-Hospital Service, as we have informed our readers on a former occasion (page 364). We may state here that several medical journals in the United States have likewise adopted it and now print all formulas and doses in that system.

The other papers contained in this volume are the following: Physical examination of seamen, by Surg. P. H. Bailhache; River exposure and its effects upon the lungs, by Surg. Walter Wyman; Yellow fever in Savannah in 1876, by Assistant Surg. Geo. H. Stone; Yellow fever in Savannah and New Brunswick, Ga., in 1876, by Assistant Surg. H. Smith; Yellow fever at Fernandina in 1877, by Surg. Rob. D. Murray.

On the Therapeutic Forces: an effort to consider the action of medicines in the light of the modern doctrine of the conservation of force. By Thos. J. Mays, M.D., member of the Luzerne county Medical Society, etc. Philadelphia: Lindsay & Blakiston. 1878. Pp. 143. Price, \$1.25.

The author states in the preface that he has firmly espoused the belief that the action of medicines in the animal body is, like everything else, amenable to unchanging laws, and that it is our duty to unravel and elucidate these laws. The view which the author favors is expressed in the title.

The introductory chapters treat of therapeutical forces in general, and discuss more particularly the subjects of tissue-waste, nitrogenous foods as tissue-builders and non-nitrogenous food as force-producers. The tissue-builders or constructive agents do not strictly fall within the scope of the essay, which is confined to those agents or forces tending to modify the molecular activity of the body. This activity may be accelerated both by chemical and mechanical forces; but rapidity of molecular motion and health are not synonymous, and there must naturally be a point where this activity can be pushed over the bounds of health into those of disease.

Chapter III treats of the *chemical stimulants*, namely, fats and oils, which are wrongly classed as hydrocarbons, carbohydrates, alcohol, phosphorus, oxygen.

The action of the *mechanical stimulants* is considered in the following two chapters. In this class are ranked quinia, quassia, berberis, columba, gentiana, nectandra, ammonia, iodine and iodides, cold, opium and those medicinal substances known as counter-irritants, such as croton oil, cantharides, mustard, etc. These are

followed by a brief chapter on *narcotics* and the concluding chapter, containing a brief recapitulation with deductions.

The little book is well written and the author's views are clearly expressed. In our opinion, even those who may not be prepared to accept the conclusions will acknowledge the value of this philosophical inquiry into the action of medicinal agents.

The Druggists' Hand-Book of Private Formulas. By John H. Nelson. Cleveland, O.: 1878. Pp. 206. Price, \$3.00.

As indicated by the title, the book contains chiefly formulas, which are classified under pharmaceutical department, perfumery department, proprietary medicines, miscellaneous formulas and appendix. A few of the formulas are officinal in the United States or some other pharmacopœia, others are intended as substitutes for officinal ones, but the large majority, over 500, comprise formulas which are either scattered in many works and journals, or are of that kind which gradually accumulate in the private manual of the apothecary and druggist. Being intended for practical use, the book naturally contains formulas for numerous so-called elegant pharmaceuticals, among them over 90 for elixirs alone, which, however, differ from those adopted by the American Pharmaceutical Association. As far as we have examined them, we believe the formulas to be "practical."

Untersuchungen aus dem Pharmaceutischen Institute der Uni-versität Dorpat. Mitgetheilt von Dragendorff. 8vo, pp. 64.

Investigations from the Pharmaceutical Institute of the University of Dorpat.

This pamphlet is a reprint from "Archiv der Pharmacie," 1878, and contains investigations of several Abyssinian remedies, namely, *ad-d-add* (*Celastrus obscurus*), which contains tannin, volatile oil and bitter principle; *tshuking* or *Zerechtit* (*Ubyaa Schimperi*), consisting of flowers, which resemble those of yarrow, and contain 1.7 volatile oil, 2.8 tannin and a trace of bitter principle; *kosāla*, consisting of brown seeds recommended against tapeworm; it was found effectual when given to a large dog, but given to small dogs and cats it produced either vomiting or gastric disturbances; its origin is unknown.

The second part of the pamphlet contains "notes on forensic chemistry" (gelsemium, jaborandi, taxus, various volatile oils, etc.), and the third part some contributions relating to the valuation of *levant wormseed*.

The following pamphlets have been received:

Belladonna as a Stimulant to the Circulatory System. By R. H. Weber, M.D. Reprinted from the Philadelphia "Medical Times."

Medico-legal Evidence relating to the Detection of Human Blood presenting the alterations characteristic of Malarial Fever, on the Clothing of a Man Accused of Murder, etc. By Prof. Jos. Jones, M.D. Reprinted from the New Orleans "Medical and Surgical Journal," August, 1878.

THE AMERICAN JOURNAL OF PHARMACY.

OCTOBER, 1878.

ADDITIONAL NOTES ON CHAMÆLIRIN AND ITS DECOMPOSITION PRODUCT, CHAMÆLIRETIN.

BY FRANCIS V. GREENE, M.D., U.S.N.

Immediately after the publication in this journal (May, 1878, p. 250) of the paper on Chamælrin, a series of experiments were made to ascertain its physiological action, during the course of which it became strikingly apparent that in several particulars its toxic effects were precisely similar to those produced by saponin. The employment of absolute alcohol as the means of extracting the bitter substance from the magnesia mass, proved conclusively that it could not be saponin, as all authorities, with the exception of Bley, who states that it is soluble in 400 parts of absolute alcohol, agree in regard to the insolubility of this glucoside in absolute alcohol. As, however, there remained the possibility that, in case the chamælrinum root contained saponin, the alcohol used in the extraction might have dissolved a sufficient quantity to account for the chemical reactions and the poisonous effects of the chamælrin, it seemed advisable to ascertain the precise action of the absolute alcohol employed on saponin itself. Accordingly, some saponin, prepared by Gehe & Co., of Dresden, after being well dried, was heated with a portion of the same kind of absolute alcohol (Squibb's) that had been used throughout the experiments, the mixture set aside, and, after the saponin had settled, a portion of the liquid filtered off and evaporated to dryness in a capsule. Distilled water was then placed in the dish, and after heating for some time it was allowed to cool, and a portion was transferred to a test-tube. On agitating the liquid no frothing was produced. This experiment proves that even had the thoroughly dried magnesia mass contained saponin, this glucoside would not have been removed by this alcohol, and consequently the entire freedom of the chamælrin from saponin may be considered as conclusively established.

As it was necessary in injecting the chamælirin hypodermically, and also into the blood vessels, to have the aqueous solution in a concentrated form, ten grains of chamælirin were placed in a beaker, and one hundred minims of distilled water added. By gentle agitation the substance gradually dissolved, giving a clear, syrupy solution, of a yellowish-brown color. Solutions of this strength were, however, found to become cloudy on standing, and to deposit a small amount of gelatinous matter in the course of a few days; it was likewise noticed that by diluting them with water while clear that a turbidity was produced, which disappeared on heating the solution, reappearing on cooling, and subsiding very slowly.

With a view of getting rid of this insoluble matter, which was evidently an impurity, and likewise removing the coloring matter, if possible, a quantity of chamælirin containing the insoluble matter was dissolved in water with agitation, and the cloudy solution set aside to settle. After the subsidence of the insoluble portion the liquid was filtered, and as a small quantity of the insoluble substance passed through the filter at the close of the operation, communicating a slight haziness to the solution, magnesia was added to it, and the mixture evaporated to dryness. The dried mass was then extracted with ether and afterwards with absolute alcohol, and the alcohol evaporated off on a water-bath. On adding distilled water to the resulting chamælirin it was found to form a perfectly clear solution, thus proving that the whole of the insoluble matter can be removed by subsidence and extraction with ether.

As the chamælirin thus obtained was still slightly colored, it was dissolved in distilled water, animal charcoal added, the mixture violently agitated, evaporated to complete dryness on a water-bath, and then extracted with boiling absolute alcohol. On evaporating the alcohol the chamælirin was found to be almost perfectly white, and to yield concentrated solutions of a very pale yellow color.

When a minute quantity of this purified chamælirin is brought in contact with a few drops of concentrated sulphuric acid, on a porcelain plate, there is produced a bright orange color, turning rapidly into a crimson, which changes to a brown color, and then to a rich green, lasting for some time, but finally passing into a purple, which gradually fades away, leaving a dark green insoluble mass in the centre of a colorless liquid. The reaction with hydrochloric acid is the same.

characteristic peach-red color mentioned in the former article. The color resulting from the action of this acid can be best observed by adding the acid to a small quantity of the substance contained in a test-tube. The precipitates formed by adding baryta water and solution of subacetate of lead to solutions of chamælirin are soluble both in water and an excess of the precipitant.

In order to determine the characters of the decomposition products of chamælirin, some of the substance was digested, at a moderate heat, with a 2 per cent. solution of hydrochloric acid, when it was found that the solution became cloudy after awhile. On adding water, and allowing the liquid to cool, the precipitate which had formed quickly subsided. A portion of the supernatant liquid was, after neutralization, tested with Fehling's solution, and gave decided evidence of the presence of glucose. The precipitate was then transferred to a filter and thoroughly washed with distilled water, when, after drying as far as possible by pressing the filter between folds of bibulous paper, it was transferred to a capsule and dissolved in absolute alcohol. On the evaporation of the alcohol, on a water-bath, the residue, for which I propose the term *chamæliretin*, was found to be a dull white, somewhat resinous substance, without taste or odor, and readily reducible to a powder. It is insoluble in water. It dissolves more readily in cold absolute alcohol than chamælirin, and remains in solution on adding about an equal volume of water, but is precipitated if the alcohol is further diluted. It is very soluble in ether. With concentrated sulphuric acid it gives a brown color, which changes after some time to an undecided purplish hue; no characteristic reactions are afforded by either nitric or hydrochloric acids.

For the purpose of solving, if possible, the problem in regard to the real character of the insoluble matter contaminating the chamælirin, a few ounces of chamælirium root were exhausted with ether, and the solution evaporated until all the ether was expelled. On adding water to the residue, and heating on the water-bath, the liquid became cloudy, and oil globules collected on the top. The liquid was then allowed to cool, when the floating mass assumed a semi-liquid appearance. After treating this oily mass with several portions of water, it was found to possess a disagreeable odor, and to give an acid reaction with litmus paper. Compounds were formed by it with baryta water, solution of sub-acetate of lead, lime water, ammonia and caustic soda solution.

It is therefore a fatty acid, and is undoubtedly the substance which, either in its free state or in some combined form, dissolves in the concentrated solutions of chamælrin.

In addition to the chamælrin and the fatty acid just referred to, a free acid, glucose, starch and tannic acid, giving a greenish precipitate with per-salts of iron, have been incidentally recognized as present in the root of the *Chamælrinum luteum*.

The physiological experiments that I have made with chamælrin prove that it is a cardiac poison, and that it produces its toxic effects by virtue of a depressing influence on the pneumogastric centres, and likewise by more or less completely exhausting or paralyzing the heart muscle. It also possesses, in common with saponin, the remarkable property of immediately dissolving the red corpuscles, when a small quantity, either in powder or aqueous solution, is added to the blood.

In November, 1876, Prof. Husemann published in the "*Archiv der Pharmacie*" a very valuable paper on the "*Distribution of the Cardiac Poisons in the Vegetable Kingdom*," wherein he pointed out that the number of families of plants containing well-established principles affecting the action of the heart was very small, and that these principles had invariably been proved to be glucosides. In the course of his communication he calls attention to various American plants belonging to the families furnishing cardiac poisons, in which he thinks there are strong grounds for suspecting the existence of principles having a toxic effect upon the heart. The discovery, therefore, of a glucoside having the properties of a cardiac poison in an indigenous plant belonging to one of these families, the *Liliacæ*, tends strongly to confirm the opinions expressed by him on this subject.

CIMICIFUGA RACEMOSA, Ell.

By FRANK H. TRIMBLE, Ph.C.

Abstract from an Inaugural Essay.

The concentrated tincture of black snake root was precipitated by water and the resin collected and put aside. The aqueous filtrate was precipitated by basic acetate of lead, the precipitate suspended in alcohol, decomposed by sulphuretted hydrogen, and the alcoholic filtrate evaporated. The residue was amorphous, could not be obtained in crystals, and gave with ferric chloride a dark-green color, similar to that produced

by quercitrin, but appears not to be a glucoside, since after boiling with muriatic acid Trommer's test failed to indicate the presence of sugar. The aqueous filtrate from the resin yielded with gelatin a white precipitate, which, however, after having been washed with water, was not colored black or dark-green by ferric chloride, proving the absence of tannin.

The resin of *cimicifuga* was freed from fatty matter by petroleum benzin and afterwards exhausted with chloroform, which dissolved an uncrystallizable resin, soluble in alcohol and ether, but insoluble in oil of turpentine and bisulphide of carbon. Its alcoholic solution, which has an acid reaction, was precipitated by subacetate of lead, the filtrate freed from lead by sulphuretted hydrogen, and evaporated spontaneously. It was expected to yield the crystalline principle described by T. E. Conard ("Am. Jour. Phar.," 1871, p. 152); but crystals could not be obtained, though the yellow resinous mass had the behavior described by him.

The lead precipitate with the chloroformic resin was decomposed by sulphuretted hydrogen; the filtrate had a decided acid reaction, was freed from some matter yielding with ammonia a brown precipitate by precipitating with water and redissolving in alcohol; after concentrating and evaporating spontaneously over sulphuric acid, greenish prisms were obtained, which were deliquescent on exposure, had an acid taste, were soluble in ether, alcohol and water, yielded with ferric chloride a white precipitate, and when heated on platinum foil fused, burned, and finally left some red-brown residue.

The fatty matter left on evaporating the benzin solution yielded to alcohol a yellow acid matter, which was partially soluble in water, soluble in ether and chloroform; gave with ferric chloride a yellow solution, had an agreeable odor, resembling that of pineapple, and was completely dissipated by heat. The fat was a soft solid at 60°F., but liquid at 100°F., was entirely free from inorganic matter, and on saponification yielded glycerin.

On treating the resin left by benzin and chloroform with alcohol, subacetate of lead, alumina, etc., as described by Mr. Conard, a little resinous mass was obtained having a behavior very similar to that of his crystalline principle.

No indications of a volatile oil or of an alkaloid were obtained. The principle which is colored green by ferric chloride entered to some extent into the various solutions made with simple solvents, but was wholly precipitated by basic acetate of lead.

HYDRASTIS CANADENSIS.

BY HERMANN LERCHEN, PH.G.

Abstract from an Inaugural Essay.

A cold infusion of the rhizome of *hydrastis* was found to contain *albumen*, *sugar*, *extractive matter* and an acid which produced a dingy-greenish precipitate with ferric chloride, but no precipitate was obtained with gelatin or sulphate of quinia, which seems to prove the absence of tannin. Boiling ether extracted from the powdered rhizome a *fatty resinous* mass, which was slightly colored, insoluble in water and nearly tasteless. Alcohol dissolved, besides the alkaloids, a brown *resin* of a soap like and bitter taste, leaving an acrid impression. On distilling the rhizome with water, the distillate contained a minute quantity of *volatile oil*, having the heavy odor of the infusion; the decoction left in the still gave, with iodine, abundant evidence of the presence of *starch*. On incinerating the powder, ten per cent. of *ash* was obtained, containing silica and carbonates, sulphates and chlorides, the bases being potassium, sodium, magnesium, calcium and iron.

The alkaloids were prepared from the cold watery infusion of *hydrastis*. On acidulating it strongly with hydrochloric acid, a yellow precipitate of hydrochlorate of *berberina* was deposited, which crystallized from alcohol in bright-yellow needles, insoluble in ether and chloroform, but soluble in water and alcohol. Strong sulphuric acid dissolves them with an olive-green color. Nitric acid changes the color to deep red, and ammonia to yellowish-brown. On adding to the solution in hot alcohol a dilute solution of iodine in potassium iodide, avoiding an excess of iodine, green spangles are produced (Perrins' test). This iodo muriate of *berberina* is sparingly soluble in cold water, but soluble in hot water and hot alcohol.

The mother liquor from the first *berberina* precipitate was treated as recommended by J. C. Burt ("Am. Jour. Phar.," 1875, p. 481); ammonia was added to it, with the precaution of keeping the liquid of a neutral reaction, and a yellow precipitate obtained which was crystallized from alcohol and then treated with dilute muriatic acid. Hydrochlorate of *berberina* was left behind, and the liquid now yielded a white precipitate of *hydrastia* with ammonia, which was left from the alcoholic solution in colorless rhombohedral crystals. These are insoluble in cold water, slightly soluble in cold alcohol and ether, soluble in

chloroform and hot alcohol. The alkaloid has an alkaline reaction on litmus paper, is soluble in strong muriatic acid, not colored by nitric acid, and when heated with strong sulphuric acid a light purple color is produced.

On adding to the neutral mother liquor of hydrastia an excess of ammonia, a dark-yellow precipitate was obtained, which crystallized from alcohol, the crystals being orange-yellow. This alkaloid dissolved in strong hydrochloric and nitric acid without change of color, and in sulphuric acid with a light-yellow. It is insoluble in cold and hot ether and in chloroform, but dissolves in hot water and alcohol, and has an acrid bitter taste. Tested with solution of iodine, in the same manner as berberina, light brown-colored spangles were obtained, entirely different from those of the berberina test. This alkaloid was first noticed by A. K. Hale (1873), and further described by J. C. Burt (1875). As yet it has not been named, and it is proposed to call it *Xanthopuccina*, from its yellow color and one of the common names of hydrastis, yellow puccoon.

PROCTER'S "VINUM DIGESTIVUM."

Nobody will ever question the right of a dealer or manufacturer to bring his goods to the notice of the public by way of advertisement, but when a manufacturer uses his advertisement to extol his preparation at the expense of another manufacturer, and thereby attempts to damage the latter one, such conduct, I think, is unfair, to say the least; particularly so, when by his statements he tries to mislead the judgment of others.

Wm. Procter, Jr., Co. say in their advertisement of *Vinum digestivum* that 1 fluidounce, mixed with 20 drops of hydrochloric acid and 4 ounces of water, dissolve out of 600 grains of coagulated albumen at least 500, and deduct therefrom that the *Vinum digestivum* is six times stronger than Scheffer's liquid pepsin.

Wm. Procter, Jr., Co. have commenced manufacturing pepsin almost immediately after I had published my process, and therefore I think it impossible that they should be ignorant of the fact that one and the same quantity of pepsin digests different quantities of albumen, according to the smaller or larger quantity of acidulated water in which the pepsin is dissolved.

When 1 fluidounce of Scheffer's liquid pepsin is mixed with 4

ounces of acidulated water, it will dissolve three or four times as much albumen as is claimed for it.

Ten grains of Scheffer's saccharated pepsin, for which I claim, when dissolved in 1 ounce of acidulated water, the strength of digesting, as minimum, 150 grains of coagulated albumen, will, when dissolved in 5 fluidounces of acidulated water, easily digest 500 out of 600 grains of albumen.

When, therefore, the allusion to Scheffer's liquid pepsin in the advertisement of Wm. Procter, Jr., Co. is not made by ignorance, it is made in a very unfair spirit, which stamps it to a dishonorable act.

E. SCHEFFER.

Louisville, September, 1878.

VINUM DIGESTIVUM.

In our advertisement of this preparation in the September number of this journal there occurs a sentence which, to our great regret, has been construed by Professor Scheffer in a manner totally different from the meaning intended to be conveyed by it. That, when testing pepsin, an increased quantity of acidulated water would determine the solution of larger quantities of albumen was well known to us, as was also the fact of the retardation of the process in the presence of alcohol. The addition of a larger proportion of water was justified by the presence of the vinous ingredient; so our test for *Vinum digestivum* was based on this, together with the desire to imitate the natural function of digestion in the amount of dilution, acidity, etc., employed.

The term "Liquid Pepsin of Scheffer" was used only in a generic sense, as applying to that preparation as made by ourselves and by hundreds of apothecaries, and not alone to the article as furnished from the laboratory of the originator.

Our reference to this was wholly without intention to detract from the merits of his article; for, while we departed from the standard established for liquid pepsin, we used its value as a measure of the comparative strength of our preparation, and in this sense only was the reference made.

The extraordinary solvent power of *Vinum digestivum* was quite as great a surprise to us when ascertained as it possibly could be to others—the difference in manipulation was the only clue to the great improve-

ment over our previous efforts to make an efficient wine of pepsin. Whether protracted contact with alcohol will affect its properties remains to be tested, as our own experience has as yet extended over three or four months only. With due deference to the liberal spirit in which Professor Scheffer gave the world the result of his researches in the field of artificial digestion, we here reiterate our disclaimer of the slightest intention of unfairness when we referred to his standard preparation. Of course, the elision of the offending sentence will be our first care.

WM. PROCTER, JR., CO.

Philadelphia, September, 1878.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

The Boiling Point of Sulphuric Acids of Different Concentration.—G. Lunge published the following table in the "*Ber. d. Deutsch. Chem. Ges.*," 1878:

Per cent. of H_2SO_4 .	Boiling Point. °C.	Per cent. of H_2SO_4 .	Boiling Point. °C.	Per cent. of H_2SO_4 .	Boiling Point. °C.
5	101	56	133	80	207
10	102	60	141.5	82	218
15	103.5	62.5	147	84	227
20	105	65	153.5	86	238.5
25	106.5	67.5	161	88	251.5
30	108	70	170	90	262.5
35	110	72	174.5	91	268
40	114	74	180.5	92	274.5
45	118.5	76	189	93	281.5
50	124	78	199	94	288.5
53	128.5			95	295

—*Pharm. Centralb.*, June 20, 1878, p. 226.

Fleischer's densimeters greatly resemble ordinary aræometers in appearance and construction, but differ in having their degrees indicated by the same number which expresses the decimal portion of the specific gravity. Thus 18° of the densimeter = 1.18 specific gravity, 50° = 1.50, spec. grav., $27\frac{1}{2}^\circ$ = 1.275 spec. grav., $21\frac{1}{4}^\circ$ = 1.2125 spec. grav., etc. The normal temperature for the division is $15^\circ C$. The densimeter for pharmaceutical purposes is supplied with a thermometer.—*Ibid.*, p. 228.

Solubility of Silver Nitrate.—The following tables give the result of J. M. Eder's investigations :

100 parts by weight of Alcohol dissolve :

Temperature.	Spec. grav. of alcohol	0.815	0.863	0.899	0.912	0.933	0.951	0.964	0.975	0.986
	Volumetric per cent.	95	80	70	60	50	40	30	20	10
At 15°C.	} Parts, by weight, of nit. of silv.	3.8	10.3	22.1	30.5	35.8	56.4	73.7	107	158
At 50		7.3			58.1		98.3		214	
At 75		18.3	42		89		160		340	

100 cc. of Alcoholic Solutions, of Different Specific Gravity, contain :

Per cent. of alcohol:	95.	80.	70.	60.	50.	40.	30.	20.	10
Grams of nitrate of silver at 15°C.=	3.	8.6	21.	27.1	33.4	52.8	60.6	89.1	130
	75	=12.5	33.6	51.		108.			

On cooling, the nitrate crystallizes in handsome thin tablets. It is sparingly soluble in pure ether, but 100 parts of water saturated with ether dissolve 88.4 parts by weight of the nitrate at 15°C.

The presence of sulphates of alkalies slightly increases the solubility of sulphate of silver in water.—*Schw. Wochenschr.*, June 7, p. 202, from *Journ. f. Pract. Chem.*

A quantitative analysis of genuine Karlsbad Sprudel Salt proved it to consist of 98 per cent. of sulphate of sodium and 2 per cent. of sulphate of potassium, thus differing from the constituents of the artificial salt, which are sulphate of sodium, chloride of sodium and carbonate of sodium. Dr. Uloth, after calling attention to the absence of sulphate of potassium in some lots of the genuine salt, suggests and recommends the following formula for imitating it:

Dry sulphate of sodium,	.	.	.	.	.	45 parts
bicarbonate of sodium,	.	.	.	.	.	33
chloride of sodium,	.	.	.	.	.	20
sulphate of potassium,	.	.	.	.	.	2

Four grams of the resulting salt dissolved in $\frac{1}{2}$ liter of warm water corresponds in strength to Karlsbad water.—*Pharm. Ztg.*, July 3, p. 460.

Tests for Glucose.—*Pellet's solution* consists of 68.7 grams crystallized sulphate of copper, 200.0 grams chloride of sodium, 100.0 anhydrous carbonate of sodium and 6.87 grams chloride of ammonium dissolved in hot water and diluted to 1 liter. 10 cc. of this liquid correspond to 0.05 gram of glucose.

Sacchse's solution of mercury consists of 18.0 grams dry iodide of mer-

cury, 25.0 iodide of potassium, 80.0 grams caustic potassa and water enough to make 1 liter. 40 cc. of this solution are heated to the boiling point, and sufficient solution of glucose is added to cause a complete reduction of the mercury, and until a few drops of the liquid cease to be blackened on the addition of sulphhydrate of ammonium. 40 cc. of this solution correspond to 0.1342 gram of glucose.—*Pharm. Centralb.*, June 13, p. 217.

Balsamum antarthriticum Indicum (*Indian balsam*) is the juice of a probably leguminous tree indigenous to the tropics, and is obtained by making deep incisions into the stem. It is used by the natives as a lotion for the whole body, it preventing, in their opinion, the injurious effects of moisture and sudden changes in the temperature; it is also employed as an antirheumatic remedy. Dr. H. v. Hoelder used it extensively for severe muscular and chronic rheumatism and arthritis, both alone and in connection with salicylic acid, and is fully convinced of its superiority over other external remedies. It has a syrupy consistence, a peculiar, characteristic, unpleasant odor, a light brown color, and contains much mucilaginous matter.—*Pharm. Ztg.*, July 6, 1878, p. 469.

Sapucaja nuts, the seeds of different species of *Lecythis* (*Lecythis ollaria*, *L. lanceolata*, *L. pisonis*, etc.), *N. O. Lecythideæ*, *Rich.*, indigenous to Brazil, were recently exported to Sweden. Dr. R. F. Friestaedt describes them as nearly cylindrical, plum-shaped, longitudinally deeply grooved, otherwise smooth, and light brown in color. The embryo is soft and has a mild and pleasant odor. They contain much fatty oil.—*Pharm. Ztschr. f. Russl.*, June 1, 1878, p. 335.

GLEANINGS FROM THE FRENCH JOURNALS.

BY THE EDITOR.

Subnitrate of Bismuth.—With the object of preparing this salt of constant composition, without any notable complications and with little loss of material, A. Lalieu has devised the following process: 200 grams of bismuth are dissolved in the usual manner in the requisite quantity of nitric acid, the solution decanted from the insoluble matter and poured into about 8 liters of water, containing 500 grams of ammonia water. The bulky white precipitate is washed, transferred to a capsule and heated in a water-bath for fifteen or twenty

minutes with 50 or 60 grams of caustic soda dissolved in a little water, whereby dense yellow anhydrous oxide of bismuth is formed. This is well washed by decantation and afterwards mixed with continued agitation with sufficient nitric acid added in small quantities, equal to 48.5 grams of nitric anhydrid; should the mixture become too hard, a little water is added, sufficient to impart a pasty consistence, and again heated in the water-bath for a few minutes, when it becomes perfectly white and rather more liquid. It is then diluted with little water, collected upon a filter resting upon a linen support, washed with about twice its volume of water, expressed and dried. The yield is about 265 grams.—*L'Union phar.*, August, p. 229-231.

Alf. Riche has investigated the causes of the variable composition of subnitrate of bismuth, and experimented with bismuth, to which 1 and 2 per cent. of lead were added. By following the process of the French Codex, in evaporating the nitric acid solution to two-thirds and adding to 40 or 50 times its volume of water, the following results were obtained:

Distilled water: The precipitate contained 15.10 per cent. N_2O_5 .

Common water of Paris: 13.78 to 12.42 N_2O_5 and traces of lead.

Common water with ammonia, leaving an acid reaction: 9.80 to 11.80 N_2O_5 and about $\frac{1}{2}$ per cent. of lead.

Common water with ammonia in slight excess: 0.60 to 2.09 N_2O_5 and 8 to 10 per cent. of lead. Carbonate of sodium used in place of ammonia gave similar results.

Well-water containing lime, chiefly sulphate: 7.79 to 11.68 N_2O_5 and .775 per cent. precipitate with sulphuric acid, of which .056 was lead, the remainder sulphate of calcium.

The precipitates with ammonia and sodium carbonate were obtained from the acid mother liquors, decanted from the precipitates with water.

The author regards the subnitrate with the maximum proportion of nitric acid as above as the most useful for medicinal purposes, and is opposed to increasing its quantity by the partial neutralization of the mother liquor; the bismuth remaining in the mother liquor may be recovered by precipitation with an alkali and utilized in various ways. Should the bismuth contain silver and lead, the former is removed by adding to the acid solution before concentration a few drops of hydrochloric acid, the latter in a similar way by a little sulphuric acid, at the

same time stirring well. Only distilled water, or such which is free from lime, should be employed for precipitating subnitrate of bismuth. —*Jour. de Pharm. et de Chim.*, August, p. 147-156.

Lead in Subnitrate of Bismuth.—Carnot has recently proposed to dissolve 10 grams of the subnitrate in hydrochloric acid, concentrate the solution to a syrupy consistence, add a little sulphuric acid and then alcohol, which will retain the chloride and sulphate of bismuth in solution, while the sulphate of lead is precipitated (see page 318). Chapuis and Linossier have found this method defective, and propose the following process: 3 grams of the salt are boiled with 4 cc. of a 10 per cent. solution of a caustic soda and sufficient (about 4 cc.) of a 10 per cent. solution of yellow chromate of potassium to render the liquid yellow. The clear liquid is decanted and the residue again boiled with 1 cc. of soda solution, a few drops of chromate and 2 or 3 cc. of water. The liquid is filtered and the filtrate acidulated with acetic acid, when chromate of lead is precipitated. One-fiftieth per cent. of lead may thus be detected if the acidulated filtrate is permitted to cool.—*Ibid.*, p. 156-159.

Falsification of Lycopodium.—Stan. Martin has observed an adulteration of lycopodium with *dextrin*, which may be recognized by macerating a portion in water for one hour with occasional agitation, filtering the liquid and evaporating it to dryness, when the dextrin will be left as an inodorous yellowish mass. Pure lycopodium, when ignited in a crucible, leaves a pulverulent charcoal of a dull black color; if mixed with dextrin, inflammable gases are given off, burning with a blueish flame, and the charcoal will be glossy and porous.—*Bull. gén. de Thérap.*, May 15, p. 410.

Pomegranate Bark.—On exhausting powdered bark of pomegranate root with ether, Durand obtained a little chlorophylli. Alcohol now took up a little brown-yellow resin, besides some principles soluble in water which were not examined. The bark was now mixed with milk of lime, the mixture dried, exhausted with alcohol, the tincture evaporated, filtered, mixed with ammonia and then agitated with chloroform, on the evaporation of which a brown-yellow residue was left. This had an alkaline reaction; by combining with an acid, decomposing with ammonia and agitating with chloroform it was obtained in whitish crystals. The solution in acetic acid yields a white

precipitate with Mayer's solution, and a brown-yellow one with compound solution of iodine. The author proposes to name the alkaloid *granatina*; its hydrochlorate was obtained in crystals.—*Jour. de Pharm. et de Chim.*, August, p. 168.

Scammony.—C. Govaerts has obtained from three different samples of scammony, as found in French commerce:

Resin,	.	.	.	.	85	20	8
Gum,	.	.	.	.	4	10	3
Starch,	.	.	.	.	—	63	75
Mineral matter, etc.,	.	.	.	.	11	7	14

The author favors the abandonment of scammony as an officinal drug, and its substitution by the resin prepared from scammony root.—*Rép. de Pharm.*, August, from *Jour. de Pharm. d'Anvers*.

Batiator root, a substitute for ipecacuanha, is described by Stan. Martin as being 2 or 3 decimeters long, thin, cylindrical, slightly flexuose, longitudinally striate or wrinkled, often with circular divisions, forming more or less elongated annulations, the fissures penetrating to the central thread like wood fibre. It is yellowish or grayish-brown, internally yellowish, breaks with a smooth fracture, is inodorous, has a slight acrid taste, and on mastication leaves in the mouth a nauseous impression, similar to that from ipecacuanha. The roots are in fascicles from a knotty uneven rootstock which is covered with short and appressed gray-brown silky hairs. The plant is found on the Senegal, and is now being propagated in Paris from the seeds. The root has properties very similar to those of ipecacuanha, and is given in similar doses.—*Bull. gén. de Thér.*, July 30, p. 74.

Syrup of ipecacuanha is proposed by Mr. Martin to be made from an alcoholic extract of the root, dissolved in water, filtered and again evaporated to an extract containing 15 per cent. of moisture. 1.50 gram of this extract is dissolved in enough warm simple syrup to obtain 1,000 grams. The author regards this process as yielding a syrup more uniform in medicinal properties than if prepared from the root.—*L'Union phar.*, June, p. 165.

Syrup of Liquorice.—Stan. Martin proposes two formulas, one made with the commercial extract, the other with the root; similar preparations are known in France as *sirop de Calabre* and *sirop de pauvre gens*. 1. 50 grams of powdered liquorice are left in contact with 150 grams of cold distilled water, and when dissolved, filtered; the

filtrate is mixed with 20 grams tartaric acid, 30 grams of tincture of fresh lemon-peel and 850 grams of simple syrup of 40° Baumé. 2. 500 grams of liquorice root, coarsely powdered, without the corky layer, are displaced with 1,500 grams of cold distilled water. The percolate is made into a syrup by using for every 100 grams of liquid 190 grams of sugar, and adding to the whole 30 grams of tincture of fresh lemon-peel and 20 grams of tartaric acid.—*Bull. gén. de Thér.*, August 30, p. 158.

Fraudulent Syrup of Almond.—Rabourdin, of Orleans, has met with an artificial orgeat syrup, which appears to have been made from a resinous tincture, probably made with tolu and benzoin, and flavored with oil of bitter almond, by mixing it with simple syrup in the proportion of 25 or 30 grams to the liter.—*L'Union phar.*, August, p. 232.

STRASSBURG TURPENTINE, its Origin and Character.

An abstract of a paper by E. G. in "*Le Monde Pharmaceutique*," de Mai 5, 1878.

The author lives in a valley of the Vosges, and is, therefore, able to procure on the spot specimens of the article of guaranteed purity and known origin. He names it *Térébenthine des Vosges*; *Térébenthine vrai dite citriodore*; Bignon, Hanbury and Flückiger name it also *Térébenthine d'Alsace*, ou de Strasbourg, ou du sapin, ou au citron; in English, Strassburg Turpentine; German, Strassburger Terpenthin. It is the product of the Sapin (French), *Abies pectinata* D. C., *Pinus Abies* Du Roy (not L.), *P. Picea*, L. In the valleys of the Vosges 25 per cent. of the trees are of this species. It flourishes best on the northern slopes of the mountains, at an altitude of 600 to 800 meters, and yields most turpentine when from 25 to 50 years old. It is then 8 to 15 meters high. After this age the quantity decreases, and at 60 years become inappreciable.

A few years since 10 to 15 mountaineers annually appeared in the valley and established themselves at a farm house, which became the centre of their forest explorations. Latterly but two or three have come to gather a quintal or two of turpentine. This is contained in little bladders in the bark, from the size of a pin's head to that of a bean, the larger ones elongated in the direction of the axis. A vessel of tinplate, shaped like a sharply-pointed horn, is used to pierce the

bladders, and a tin can hanging at the side receives the day's gathering. The harvest is tedious, laborious and even dangerous, for the large trunks must be climbed to reach the bladders in the higher parts of the tree. No incisions are ever made. The crude product is roughly purified by standing it in the sun in the tin cans to allow heavy impurities to settle; it is then filtered through a bed of the branches and needles of the silver fir placed in a funnel of bark. When purified it sells at 4f. 80c. to 5f. 50c. a kilogram.

The fresh oleoresin is very fluid, flowing like syrup, color like amber, odor balsamic, sweet but not cloying, recalling that of lemons, and becoming more apparent in alcoholic solution; taste very acrid, slightly bitter. It is strongly acid, and dries easily, losing weight. It is soluble in its own weight of alcohol, the solution remaining clear after three months' rest. It is solidified in a few hours by $\frac{1}{6}$ of its weight of magnesia, and after 24 hours the mass becomes almost brittle. The last two characters are the most important, as Guibourt and Dorvault respectively announce their absence in Térébenthine de Strasbourg ou des Vosges.—*Chem. and Drug.*, June 15, 1878.

THE MESQUITE.

An industry that promises, perhaps, to be of considerable importance has recently sprung up in the West. The mesquite, a common tree of the deserts, and closely allied, botanically, to the acacia, yields, like the latter, a gum which closely resembles, and, in fact, is almost identical with, gum acacia (the gum arabic of commerce). This gum was brought to notice as long ago as 1854, by Dr. Shumard, of the United States Army. It has for some time been kept in the drug stores of the Mexican cities, and considerable quantities have been sent to San Francisco from the Mexican ports of the Pacific. During the past year it has become an article of export, some 12,000 lbs. having been gathered in Bexar county, Texas, and as much more between that and the coast.

The mesquite (or, as it is sometimes called, mosqueit) is the Mexican name for a leguminous tree belonging, like the gum arabic producing acacia, to the sub order *Mimoseæ*. It is a tree growing from 30 to 40 feet in height, with a rounded head. It bears, in its general aspect, a great resemblance to the common honey locust (*Gleditschia*); its leaves are twice-pinnate, and the leaflets narrow, somewhat curved, and

an inch or more in length ; the flowers are small, greenish-yellow, and crowded in dense axillary spikes ; the pod or bean is from 6 to 9 inches in length, curved or straight, flattened, and constricted between the seeds.

There are several species of mesquite, but the one under consideration (*Prosopis glandulosa* of botanists) has the widest range, being found as far north as the Canada river, and extending south into Mexico ; it appears in Texas not far from the coast, and is the most abundant tree as far west as the Colorado and Gulf of California. Were it not for the presence of the mesquite immense tracts in Arizona and Northern Mexico would present greater difficulties to travelers than they do, since this tree affords the sole fuel and forage of the country. As fuel, the wood has no superior ; it makes a fire almost as intense as one of anthracite. The pods or beans, which ripen in June, contain a sugary pulp, having an agreeable blending of sweetness and acidity, somewhat like the harvest apple. They are very nutritious, and while their importance to the civilized traveler lies in their value as food for horses in districts destitute of grass, they are of still greater importance as articles of food to the Indians living within its reach. To whites, the taste of the fruit is somewhat mawkish and unpleasant, but it is greatly relished by the Mexicans and Indians. The latter, when the pods are in a fresh, ripe state, put them into a wooden or stone mortar and bruise them, then mix them with water and empty them into an earthen dish, where, after standing a few hours, there results a sort of cold porridge or mush. All present then collect around the newly-prepared mess, and, sitting on the ground near the dish, scoop the food out with their hands without any ceremony, and without regard to distinction of rank, age or sex. The nearly naked bodies of the Indians soon become smeared with the food from head to foot, and the shaggy appearance of their hair adds nothing to their aspect of cleanliness. The meal finished, their faces assume a complaisant look, while their tumid abdomens give abundant evidence of the quantity of food consumed.

The pods, as they ripen, are gathered for winter use ; and, after being thoroughly dried, are stowed in cylindrical-shaped baskets made of twigs, and covered with mud and grass to keep out rain. In this shape they can be preserved for a long time. They are among the great luxuries of the Apaches, Pimas, Yumas, Maricopas, Mohaves, Hualipais, Cocopahs and Moquis of Arizona, besides of many tribes

in New Mexico, Utah, Nevada and the southern portion of California. The squaws pound the dry pods until reduced to a fine powder, which, being mixed with a little water, is pressed into large thick cakes weighing several pounds, and these being dried in the sun are afterwards used as circumstances require. The pods are also often kept in the powdered state in bags; but if the beans are not pulverized as fine as the pulp they soon become a living mass, since from every bean will issue a weevil, a species of *bruchus*. To the Indians, however, this is a matter of indifference, and they never trouble themselves to pick the insect out, but allow them to become an ingredient of the bread. If reduced to a fine flour, the insect larva becomes a part, forming a homogeneous mass of animal and vegetable substance. The flour, being very sweet, forms, when mixed with water, an agreeable drink; boiled in water and fermented, there results a pleasant and nutritious beverage, held in great esteem by the natives. The bark of the tree is utilized by the Indian women for making skirts, and it is also twisted into ropes or twine, and even woven into baskets.

The gum which exudes spontaneously from the bark of the tree is described as very similar in its properties to gum arabic, and an analysis by Dr. Morfit has shown that in composition and chemical properties it very closely resembles the latter. As it oozes from the bark it concretes into tears and lumps of various sizes, which vary in color from pale-yellow to dark-amber. It is very brittle, easy to pulverize, and its fractured surfaces are brilliant.

The natural exudations from a single tree vary from an ounce to three pounds, but doubtless much more would be yielded were incisions made in the bark. The branches are said to furnish a purer quality than the trunk. The gum, when perforated by insects, is often eaten by the Indians. All the tribes of Arizona mix this exudation with mud, which is then daubed over the head, thus serving two purposes—killing parasites, and rendering the hair dark and glossy. As the mesquite trees abound upon the plains over regions thousands of miles in extent, and flourish luxuriantly in dry and elevated situations, the gum must, in course of time, become an important commercial article when the facilities for gathering it become more perfect.—*Scientific American*, Aug. 31, 1878.

A NEW TEST FOR GLYCERIN.

BY A. SENIER, M. D., and A. J. G. LOWE, Assistants in the Laboratories of the Pharmaceutical Society.

In a previous paper ("Pharm Jour.," viii, 819) we have shown that when certain acid borates, as, for example, ordinary sodium baborate, are dissolved by glycerin, the glycerin does not act simply as a solvent. We found that acid was evolved, which was probably free boracic acid, and that there remained behind more basic borates, having a constitution between mono- and bi-borates. Klein ("Compt. rend.," lxxxvi, 826) says that with acid borates mannite forms conjugated acids. He describes briefly some compounds obtained, and then says that similar reactions take place in the case of glycerin, erythrite and certain other polyatomic alcohols. It is true that mannite, erythrite, etc., evolve acid with sodium baborate in the same manner as glycerin, but the reactions are probably not the same. The test which we are about to describe is not given by mannite, glucose, etc., although it is readily obtained from glycerin, erythrite, and apparently from glycol. We are at present investigating this reaction more fully. It is interesting, however, to note here, that while we find the action of glycerin and erythrite to differ from the action of mannite and glucose, Klein also finds the action upon polarized light different in the case of the two former, from what it is in that of the latter. The well-known green color which free boracic acid imparts to flame is usually obtained in the case of borates by the use of a stronger acid, but Iles ("Chem. News," xxxv, 204) suggests that glycerin may advantageously be substituted for the acid. The glycerin test for boracic acid involves, of course, the reaction which we have just discussed.

It occurred to us that this reaction might also be employed as a test for glycerin, but before we describe the method of applying it to that end, it will be convenient to discuss briefly its limits as regards other bodies. As might be anticipated from what we have said, monoborates do not give this reaction, at least that is the case with sodium monoborate. A considerable quantity of alkali interferes with the test, doubtless by neutralizing and fixing the acid set free. Again, a large excess of borax itself prevents the appearance of the green color in the flame. This action of a large excess of borax is interesting. Now as to bodies which may be mistaken for glycerin. Acids give the same result to flame as glycerin, and hence the solution to be tested

must be neutral or faintly alkaline. Erythrite, and apparently glycol, also give the same green flame, but could hardly occur so as to be mistaken for glycerin. The same may be said of copper salts and certain other substances, which of themselves might impart a green color to flame. Other substances, such as sugars, fats, etc., were tried, but all failed to give this test. It appears, then, in the absence of erythrite, and probably glycol, to be a property fairly characteristic of glycerin.

The test is applied as follows: The aqueous solution to be examined is first made slightly alkaline with dilute soda-solution, and a borax bead is dipped into it. The bead is allowed to rest for a minute or so to allow solution to take place on its surface. Then it is held in the Bunsen flame in the usual way. Another method, and this we find more delicate, is to place a little powdered borax on a watch glass, and pour on to it some of the solution made faintly alkaline. Stir with a glass rod (the mixture becomes acid of course), and by means of a looped platinum wire introduce some of the mixture into the flame. In either case the deep green color appears more or less distinctly if glycerin be present in sufficient quantity.

The following experiments were made with the view of determining the extent to which the test could be applied to the detection of glycerin in various solutions. The percentages are by volume:

Glycerin in Water.—The solutions were made faintly alkaline. A 20 per cent. solution gave the color very decidedly. Solutions containing 15, 10 and 5 percentages gave the color distinctly. 2½ per cent. gave a faint color, and the limit seemed to be reached in the case of a 1 per cent. solution, which gave scarcely any color.

Glycerin in Beer.—The solutions were made faintly alkaline. 25 and 20 per cent. solutions gave the color decidedly. A 10 per cent. solution gave it distinctly, but in the case of a 5 per cent. solution it could scarcely be seen. It was evident from these experiments that, in order to detect less than 10 per cent. in beer, the solution of glycerin would have to be concentrated, and some of the foreign matter removed. To try this we prepared two solutions of glycerin, one containing 5 per cent. and the other 1 per cent. Both were treated in the same manner. 50 cc. were evaporated to dryness over a water-bath, and the residue was treated with 50 cc. of absolute alcohol. Solution of the glycerin in the alcohol was insured by well stirring the mixture and heating to boiling. The dish containing the mixture was then set

aside to cool and subside, after which the clear alcoholic solution containing the glycerin was decanted into another dish. The solution was evaporated to dryness as before, and again exhausted with absolute alcohol. The solution from this second treatment with alcohol was evaporated nearly to dryness, and a few drops of water added. The solution thus obtained was made faintly alkaline to delicate litmus paper with dilute soda solution, and tested in the manner already described. In each case the color was distinct, of course most decided in the case of the residue from the 5 per cent. solution. A solution containing onequarter of 1 per cent. was examined in the same way, and gave the color distinctly. Beer, to which was added only one-tenth of 1 per cent. of glycerin was examined by first concentrating and shaking with petroleum ether, to remove hop resin, and then evaporating to dryness and treating as above. In this case green color, though less intense than before, was distinctly seen. Several experiments were made with beers to which glycerin was not added; but treating them in the way described no green color could be obtained. It was noticed that the consistence of the residues from beers to which glycerin had been added, compared with the residues of beers containing no glycerin, was very different. The former were, of course, moist and syrupy, while the latter were much harder and even brittle.

Glycerin in Wine.—To some sherry wine was added 1 per cent. of glycerin. Of this solution 50 cc. were evaporated to dryness over a water-bath. The residue was treated, as previously described, with 25 cc. of absolute alcohol. The alcohol solution was then evaporated over a water-bath nearly to dryness, and a few drops of water added. This solution, made faintly alkaline and tested, gave the green flame distinctly. The same wine without glycerin gave no green color to flame.

Glycerin in Milk.—100 cc. of milk, to which 1 per cent. of glycerin was added, were evaporated to dryness over a water-bath. The residue was treated with 50 cc. absolute alcohol, and the alcoholic solution so obtained evaporated to dryness as before. A few drops of water were added, and the mixture filtered through a moistened filter to separate fat. The filtrate was then rendered alkaline and tested. The green color was distinctly observed. 100 cc. of milk without

glycerin similarly treated gave no green color. The fat of milk likewise gave no color reaction.

Glycerin in Treacle.—50 cc. of treacle, in which was dissolved by aid of heat and agitation 5 per cent. of glycerin, were, while warm, well agitated with absolute alcohol. The mixture was set aside, and allowed to cool and separate. The alcoholic solution was then decanted, and evaporated over a water-bath to dryness. This residue was treated with 50 cc. of absolute alcohol in the usual way, and the alcoholic solution so obtained evaporated over a water-bath to dryness. This second residue was treated in the same way with 25 cc. of absolute alcohol, and the solution obtained was evaporated as before. The residue was diluted with a few drops of water, and the solution made faintly alkaline. Tested, it gave the green color distinctly. A 1 per cent. solution failed to give the reaction, thus showing at the same time that treacle itself treated in this way is incapable of producing the green color.

It may be said then of the test for glycerin here proposed that it is practically characteristic, and is delicate. It can be easily applied, and is not interfered with by the presence of a considerable quantity of foreign matter. We therefore commend it to trial by chemists as a substitute for the known tests for glycerin, which are not only few but objectionable.

In conclusion we have to express our indebtedness to Mr. H. G. Greenish for valuable assistance, and to Professor Attfield for kindly permitting these experiments to be conducted in the Laboratories of the Pharmaceutical Society.

AUTHORS' NOTE.—In the discussion which followed the reading of the above paper our attention was directed to the fact investigated by Woodcock ("Jour. Chem. Soc.," xxiv, 785), that ammoniacal salts have the power of decomposing borax and liberating boracic acid. It was suggested that these salts might be mistaken for glycerin unless further precautions were taken. We find this to be the case.

Substances to be examined for glycerin by the test we have suggested should be first tested for ammonia, and should this be present the above methods must be so modified as to secure its complete exclusion. To determine the presence of ammonium salts, sodium carbonate, and in some cases the Nessler reagent, should be employed. The following

two experiments will suggest how ammonium salts may be separated. When fats occur they must, of course, be removed prior to treatment with alkali;

50 cc. of an aqueous solution containing 1 per cent. each of ammonium chloride and glycerin, were evaporated in a platinum dish over a water-bath to dryness. Saturated solution of sodium carbonate was then added, and the heat of the water-bath continued until no more ammoniacal gas was evolved, and the mixture was distinctly alkaline. The mixture was then extracted with absolute alcohol, and the solution evaporated, neutralized and tested. The green color was distinctly seen.

50 cc. of beer, containing 1 per cent. each of ammonium chloride and glycerin were evaporated to dryness over a water-bath. The ammoniacal salt was separated from the residue as before. The mixture thus obtained was treated with absolute alcohol, as described in the paper, and tested, the final solution being neutral, or only faintly alkaline. The green flame was very distinct. 50 cc. of beer containing ammonium chloride only were examined in the same way, but gave no green color to flame.—*Jour. Chem. Soc.* [London], September, 1878.

KINATE OF QUINIA FOR HYPODERMIC INJECTION.

BY HENRY COLLIER, Guy's Hospital.

I have on several occasions been called upon to make a solution of quinia for hypodermic injection, and as the ordinary salts of quinia (the sulphate and hydrochlorate) are not very soluble in water, the subject has always been with me a very unsatisfactory one.

This method of administration is desirable when the patient is so constantly sick that quinia cannot be given by the stomach, and in such cases the principal object in giving the remedy is to reduce temperature. Large doses are also required.

Solutions intended for hypodermic use require to be neutral, and of such a strength that a few minims only are needed for injection. I have prepared a solution of ordinary quinia sulphate, containing 1 grain in 10 minims, by heating the quinia and water in a beaker, and adding just sufficient dilute sulphuric acid to dissolve the quinia; but of course the solution had a very acid reaction. In one case, however, in which this was employed, the patient did remarkably well, and no irritation

was produced by the punctures. I have made some of the so-called neutral sulphate of quinia, but even after a second crystallization its solution was very acid, and it was not more soluble than 1 in 10. Hydrochlorate of quinia is fairly soluble in warm water, and such a solution has been injected warm, but the result was not satisfactory. In Parrish's "Practical Pharmacy" it is stated that kinate of quinia is soluble in 4 parts of water, and a process is given for its preparation direct from cinchona bark. I, however, procured from Mr. Morson some kinate of calcium, which I converted into barium kinate. This salt is freely soluble in water, and upon adding to its solution sulphate of quinia, in powder, the whole of the barium is precipitated and kinate of quinia remains in solution. Upon evaporation the kinate comes out in amorphous masses; even when evaporated under the air-pump over H_2SO_4 , the same result is obtained. A drop of the same solution spread over a glass slide and evaporated slowly, shows under the microscope very distinct crystalline tufts. The plan I adopt is to reduce the solution of kinate to dryness over a water-bath, and then powder the residue. The kinate obtained by slow evaporation at ordinary temperatures contains a large quantity of water, some of which it loses by keeping at $90^{\circ}F.$, so that to insure a definite product it is necessary to dry it.

Kinate of quinia is very soluble in water, and its solution is perfectly neutral. The strength of the solution which is used at this hospital is 1 in 4. I generally prepare $\bar{3}i$ of the solution at a time, by putting into a beaker $\bar{3}vi$ aq. destil. and $\bar{3}ii$ kinate of quinia, heating until the salt dissolves, which it does almost immediately, and then making up with aq. destil. to $\bar{3}i$. It is quite possible to make a permanent solution containing 1 in 3, but I find that 1 in 4 is more convenient for use. Even with this strength the syringe requires constant washing and the solution great attention, as the stopper and neck of the bottle soon become coated with solid kinate. Kinate of quinia has so far given satisfaction, and as it possesses the two great attributes of solubility and neutrality, I think that perhaps this salt will supply a want which has existed.

M. Yvon, in the "Jour. de Phar. et de Chim.," recommends the use of lactate of quinia for hypodermic injection, and in "L'Union Pharm." of last May, the sulphovinate of quinia is stated to be very suitable for the same purpose. It would be interesting to know what results have followed the use of these salts.—*Phar. Jour. and Trans.*, Aug. 10, 1878.

THE ALKALOIDS OF VERATRUM SABADILLA.

By C. R. ALDER WRIGHT, D.Sc. (Lond.), Lecturer on Chemistry, and A. P. LUFF,
Demonstrator of Chemistry in St. Mary's Hospital Medical School.

After giving the history relating to the chemical investigation of Sabadilla seeds, the authors report in detail the results of their investigations, which are summed up in the following *general conclusions* :

(1.) The seeds of *Veratrum Sabadilla* (sometimes designated *Veratrum officinale*, *Sabadilla officinarum* or *Asagræa officinalis*) contain an alkaloid, first isolated by Couerbe, and termed by him *veratria*, which is indicated by the formula $C_{37}H_{53}NO_{11}$, or one very close thereto; this is non-crystalline, but furnishes certain crystallizable salts: on saponification it splits up into veratric acid (dimethyl-protocatechuic acid) and a new base, *verina*, thus, $C_{37}H_{53}NO_{11} + H_2O = C_9H_{10}O_4 + C_{28}H_{45}NO_3$.

(2.) In addition, a considerably larger quantity of another alkaloid is present, first isolated by Merck, and described by him as "*veratria*." To distinguish this from the former alkaloid, which has the prior claim to the name *veratria*, we propose to term it *cevadina*, reserving the name *veratria* for Couerbe's base. This *cevadina* is crystallizable, melts at 205° to 206° , and on saponification splits up in accordance with the reaction, $C_{32}H_{49}NO_9 + H_2O = C_5H_8O_2 + C_{27}H_{43}NO_8$, forming a base *cevina*, and an acid identical with the methyl-crotonic acid of Frankland and Duppa, and with the cevadic acid of Pelletier and Caventou.

(3.) The formulæ assigned by Merck, by Weigelin and by Schmidt and Köppen to *cevadina* are all more or less erroneous, that of the latter pair of chemists being nearest to the truth, $C_{32}H_{49}NO_9$.

(4.) There is no good reason for supposing the existence of isomeric modifications of *cevadina* (so-called "*veratria*") in the *sabadilla* alkaloids, these supposed bodies being either mixtures of bases, thereby rendered highly difficult to crystallize, or products of alteration by saponification of the above-named bases.

(5.) The body described as "*sabadillia*" by Weigelin was not to be found in the substances examined by us; neither in the alkaloids extracted by ourselves by the tartaric acid process, nor in the commercial so-called "*veratria*" obtained from Hopkin and Williams, nor in the product purchased as "*sabadillia*" from Burgoyne and Burbidges. On the other hand, the first and last of these substances contained an alkaloid almost insoluble in ether, and agreeing in that respect with

"sabadillia," but non-crystalline and insoluble in water, and differing therefore in these respects; this body gave numbers agreeing with $C_{31}H_{53}NO_8$, and on saponification appeared to form cevadic acid. To indicate this latter fact and to connote its partial resemblance to "sabadillia," we propose to term it *cevadillina*.

(6.) The "sabatrina" of Weigelin is doubtless simply a mixture of resonoid alteration-products, as is also Couerbe's "hydrate of sabadillia."

(7.) The sabadilla alkaloids are not merely constituted like the aconite bases (*i. e.*, as regards saponification and in the case of cevadina, hydroxylation), but they also contain nitrogenous radicles, which appear to be closely allied to those of the aconite alkaloids.—*Four. Chem. Soc.* Aug., p. 358.

MORPHIA REACTIONS.

BY DAVID LINDO.

During the analysis of a complex mixture it was noticed that the aqueous solution exhibited an intense green color. This solution was found to contain ammonia and copper salts with organic matter, which proved to be morphia. I have not seen this color-reaction mentioned before, and as it might sometimes prove useful as a confirmatory test for morphia, I have endeavored to ascertain the conditions most favorable to its development. These appear to be as follows:

Dissolve 1 part crystallized sulphate of copper in 10 parts of water; add solution of ammonia cautiously and with active stirring until the precipitate is just dissolved.

To ascertain if this solution is fit for the intended purpose, dissolve 2 grains muriate morphia in 1 ounce of distilled water; place some of this in a test-tube, add a few drops of the test-fluid and shake the vessel slightly. If a precipitate or permanent turbidity is observed, the test-fluid requires a little more ammonia, which should be added in small quantity at a time, and the mixture well shaken after each addition, as a notable excess prevents the test from acting. Adding ammonia to the morphia mixture that is being tested to rectify deficiency in the test-fluid will not be found to answer.

When a few drops of a properly-prepared test-fluid are added to a neutral solution of morphia salt of the above strength, and the tube is slightly shaken, no cloudiness will be observed, but the fluid assumes a

magnificent emerald-green color, either immediately or after a short time. Weaker solutions may require to be gently heated, but the mixture must not be boiled or the reaction is destroyed, suboxide of copper being precipitated.

Of a stronger solution of morphia salt one drop is sufficient to give a good reaction on a white porcelain surface. The test-fluid should be applied on a slender glass rod, and stirred in as soon as it is taken from the bottle.

If the copper solution has not been added in sufficient quantity the color obtained will be yellowish-green. Large excess of the reagent destroys the reaction, and so does the addition of a few drops of liquor ammonia.

Phenol is the only other colorless organic compound I have met with as yet which affords a similar color-reaction with the test, but further experience on this point is desirable.—*Chem. News*, Aug. 9, 1878.

Falmouth, Jamaica, June 25, 1878.

GNOSCOPINA.

By T. and H. SMITH.

In the mother-liquors from the purification of narceina we have now repeatedly met with a crystalline body, which, distinguished at first from the principles more generally met with in opium by its melting point and its slight solubility in spirit, was, upon closer examination, ascertained to be a hitherto unknown alkaloid, and which we have named Gnoscopina.

This principle is characterized by forming readily crystallizable salts, which have an acid reaction. That its salts possess this reaction, as also the fact that gnoscopina is quite insoluble in water and in alkalies, marks its strong resemblance to the papaverina group. Hence, also, it is easily separated from narceina, which is moderately soluble in boiling water, and freely so in alkalies.

Gnoscopina when pure (after being repeatedly crystallized from boiling spirit) forms long thin white needles, having a woolly character when dried. It is soluble in 1,500 parts of cold spirit. It melts at 233°C., decomposing, however, at the same time, and burning with a smoky flame, leaves a skeleton of charcoal that burns entirely away at

a high temperature. It forms a muriate which crystallizes in glassy prisms, apparently containing water of crystallization, which is lost at a moderate heat. A solution of this salt gives a buff-colored crystalline precipitate with platino-chloride of potassium, and a white precipitate with iodide of mercury and potassium. In pure sulphuric acid, gnoscopina dissolves with a slightly yellow color, which becomes at once carmine-red upon the addition of a trace of nitric acid, and remains so. In this respect gnoscopina differs from rhœadina, which assumes this red color upon the addition either of sulphuric or hydrochloric acid alone. Gnoscopina is insoluble either in aqueous or in spirituous solutions of caustic soda, also in mineral spirit, and in fusel oil, but is soluble in chloroform and bisulphide of carbon and slightly so in benzol.

According to the following analyses, the formula of gnoscopina is $C_{34}H_{36}N_2O_{11}$:

- (a) Weight of substance taken, 0.2840 gram.
 H_2O obtained, = 0.1455
 CO_2 " = 0.6565
- (b) substance taken, 0.3105
 H_2O obtained, = 0.1562
 CO_2 " = 0.720
- (c) substance taken, 0.4563
 Volume of N obtained, 16.2 cc. = 0.01996 gr.
 Temp., 9.0°C.; Barom, 755.7 mm.

from which there follows:

Calculated.		Found.			
		a.	b.	c.	Medium.
C_{24}	62.96	63.04	63.24	—	63.14
H_{36}	5.56	5.69	5.59	—	5.64
N_2	4.32	—	—	4.37	4.37
O_{11}	27.16	—	—	—	26.85

A specimen of pure crystals of this alkaloid is shown in our case at the Paris Exhibition.—*Phar. Jour. and Trans.* [Lond.], Aug. 3, 1878.

THE BLUE SOLUTION OF MOLYBDIC ACID AS A REAGENT.

BY O. MASCHKE.

If calcium molybdate is moistened with a quantity of dilute hydrochloric acid sufficient to produce a clear solution on the application of a gentle heat, a deep blue coloration quickly appears in the liquid. In place of calcium molybdate those of ammonium, sodium or potassium may be used, adding so much hydrochloric acid that the liquid if poured upon a plate of polished marble may produce a visible but very slight effervescence. If after cooling a concentrated solution of sodium or calcium chloride is poured into the liquid there is formed a blue-black precipitate, not easily distinguished in the liquid, and which may be regarded as a compound of molybdic acid and molybdic oxide. It dissolves with great ease, not merely in water but also in alcohol, and produces a coloration of extraordinary intensity. The author prepares the solution as follows: 3 grams calcium molybdate, 250 cc. of water, and enough of hydrochloric acid to effect the solution of 2 grams of cane- or grape-sugar. When the deep blue coloration is apparent the ebullition is continued for five minutes. When the precipitate has been produced with sodium or calcium chloride, it is washed upon the filter first with the precipitant and then with a little water. As soon as the liquid begins to run through of a deep blue color, the filter with its contents is placed in distilled water and the solution finally made up to 250 cc. This blue solution is decolorized with extreme ease by caustic alkalies and oxidizing agents, such as chlorine, nitrous acid, hydrogen peroxide and permanganic acid. Hydrochloric acid of spec. grav. 1.24 produces in this solution a blue precipitate, the supernatant liquid being colorless. Sulphuric acid of spec. grav. 1.840 does not give a precipitate, but the color of the liquid is altered. Nitric acid of spec. grav. 1.185 produces a rapid decoloration. Dilute solutions of ferric salts decolorize, and those of ferrous salts occasion turbidity. The author has endeavored to employ the blue solution to detect nitrous acid in spring waters. The water under examination is mixed with a little caustic soda; after filtration, so much acetic acid is added that the liquid may have but a very feeble acid reaction. A test-tube is three-fourths filled with this liquid and about 6 to 10 drops of dilute acetic acid and 1 to 2 drops of the blue molybdic solution are added, so that, in placing the tube upon a white surface and viewing it longi-

tudinally, only a very slight blue coloration may be perceived. Water containing only some tenths of a milligram of nitrous acid per liter will certainly destroy the color in an hour. The rapidity and distinctness of the reaction are remarkably increased on heating the liquid mixture gently for a short time. Solutions of potassium nitrate, containing one-tenth of a millionth of nitrous acid per cc. are decolorized in a few minutes after being gently heated. A strong and prolonged heat is to be avoided. Attempts made at the titration of nitrous acid by means of the blue molybdic solution, have so far given unsatisfactory results. Still if we admit that 1 mol. of permanganic acid corresponds to 5 mols. of molybdic oxide, it is easy to determine with precision the quantity of molybdic oxide contained in a liquid by titration with permanganate. It might therefore be possible to determine nitrous acid in a satisfactory manner by causing the blue solution of molybdic acid to react for a certain time, the length of which must be experimentally determined, and then titrating back with permanganate. The blue solution is not very stable.—*Chem. News* [Lond.], July 12, 1878, from *Zeitschrift für Anal. Chemie*.

SOLUBLE ESSENCE OF GINGER.¹

BY J. C. THRESH, Pharmaceutical Chemist.

Requiring some time ago a strong solution of the active principles of ginger which would mix with water or syrup without causing turbidity, I was led to make a number of inquiries and experiments, some of the results of which it is the purpose of this paper to communicate.

I found that most wholesale drug houses made and kept in stock a so-called soluble ginger essence, but in many cases the pungency was due to cayenne, and (with one exception) the pleasing aroma of ginger was woefully deficient.

I also obtained several receipts for this essence, but none of them gave satisfactory results. One ordered the powdered root to be percolated with a dilute alcohol, another with a mixture of spirit and glycerin, a third ordered a strong decoction of the ginger to be fortified and preserved by the addition of a weak tincture of cayenne, etc., but not one of them yielded a result possessing the full flavor and odor of the ginger from which it had been prepared.

¹ Read before the British Pharmaceutical Conference.

I then began to investigate for myself, and ultimately succeeded in making an essence which answered my requirements ; but before giving the form for its preparation, allow me to say a few words about the varieties of ginger and of the essence, or rather B. P. strong tinctures, found in the market. On making the soluble essence from the B.P. strong tincture obtained from different houses, I was much struck by the varying qualities (judged by the odor) of the essences made therefrom. Most of the strong tinctures were of a deep red-brown color, and contained a large percentage of resinous matter in solution, and invariably the darker the tincture the more inferior the essence. These I have no doubt were made with Jamaica ginger of inferior quality, for I find that the cheaper kinds are much richer in resins, whilst they are equally poor with regard to the volatile aromatic principle. In the strong tincture the spirit conceals the aroma ; hence it is difficult to compare the two specimens by their odor without diluting them. Let them be diluted, however, and then compare the essence prepared from fine Jamaica ginger and that made from an inferior variety. The difference is so surprising that I have heard an experienced chemist doubt whether the fragrant odor of the former was solely due to the ginger used.

To return to my subject. After finding a method of making the soluble tincture, and trying the effects of varying the proportions of the ingredients, the following form was fixed upon as yielding upon the whole the best results :

Take of finest Jamaica ginger in powder 1 pound ; pour upon this 8 ounces of rectified spirit, and after allowing to stand for several hours add more spirit ; percolate to 16 ounces. To this add 2 ounces of heavy carbonate of magnesia, agitate and add 24 ounces of water. Shake well and filter. If the filtrate is turbid the whole must be shaken with a little more magnesia and again filtered. The filtrate possesses all the aroma of the ginger, and a fair share of its pungency, and is of a pleasing yellow-brown color. After keeping a few days it becomes turbid and deposits slightly, but if again filtered appears to continue clear.

The action of the magnesia probably is partly mechanical, partly chemical, for the peculiar tint of the essence is undoubtedly due to the action of the hydrate of magnesia upon the ginger resin, and the precipitate which forms soon after the essence is first made is a com-

pound of resin and magnesia. I had suspected that the resin left in solution differed from that removed, but upon evaporating the soluble essence and examining the resinous residue I could detect no difference between them; moreover when dissolved in spirit, diluted and shaken with magnesia, most of it was removed from solution, and the magnesia compound resembled that first separated.

I have since found that calcium sulphate, calcium carbonate and charcoal powder are equally efficacious in removing the excess of resin, but the resulting solution is in all cases much paler in color, and probably when charcoal is used the odor may not be so strong. These no doubt act mechanically, causing the aggregation of the resin precipitated by the water; hence it is probable that any fine inert powder will answer as well as the magnesia.

A syrup made by mixing equal quantities of strong simple syrup and soluble essence is very suitable for using with gazogenes, and a weaker syrup might with advantage replace the unsightly preparation of the *Pharmacopœia*.

The belief that this subject would be of interest to many pharmacists, and that the results of my imperfect investigation would be of value to others, must be my apology for troubling the Conference with this paper.

Specimens of soluble essence and of syrup made therefrom are upon the table, at the service of any member who would like to examine them.—*Phar. Jour. and Trans.*, Aug. 31, 1878.

SOLUBLE ESSENCE OF GINGER.¹

BY B. S. PROCTOR.

Commercial samples have no great alcoholic strength.

Essence of ginger made with strong spirit and diluted with water continues milky for a long time.

The same mixed with a little alum or sulphuric acid becomes clear after standing some time (a week or two?). The quantity of alum or acid requisite is not sufficient to impart any taste to the essence produced, and may be got rid of (the acid most completely) by mixing with pure carbonate of lime and filtering. A clear, pungent, aromatic essence is thus produced, which turns slightly opalescent when mixed with water.

¹ Read before the British Pharmaceutical Conference.

Mr. Umney thought that for this paper the Conference was much indebted to Mr. Thresh, especially the Irish members, for in no place of an equal population was the manufacture of aerated waters so extensively carried on. A good essence of ginger was still a desideratum. He had for some time been trying to make a good soluble essence. He had made considerable quantities by a process similar to that now indicated, but with the omission of the spirit, using dilute glycerin only. He found that this did not take up the resinous principle, but the essential oil only, and as far as he could judge, this essence was merely a solution of the essential oil. He was glad to find that Mr. Thresh was investigating this matter, as he had previously investigated capsicin very successfully, and he felt sure that if he carried on his experiments much benefit would result. There was no doubt the different varieties of ginger had a great effect on the resulting essence. He had tried all kinds, and had found some specimens of Jamaica ginger so mucilaginous that there was no doing anything with them. This process of exhaustion by spirits of wine and precipitation of resinous matter by means of some mechanical body, such as carbonate of magnesia, seemed a good one, but he was not prepared to say that the process was wholly mechanical. If crude animal charcoal were used he presumed it would have some chemical effect.

Mr. Savage said this was one of those practical papers which were always appreciated by the trade. Some time ago a ginger beer maker called upon him, and said that he was in the habit of using essence of ginger, but he always found the beer became opaque. He found the remedy was, instead of using strong spirit, to use it in the proportion now given, two of spirit to three of water. This did not dissolve the resin, and the compound was satisfactory.

Dr. Symes had found, in examining samples of ginger with regard to their suitability for preparing essence, that a good method was to prepare a small quantity by treating it with a small quantity of spirit and adding a few drops of the essence so obtained to a large quantity of water, say ten minims to an ounce of water. The water seemed to have the property of throwing up the flavor and making it apparent, and strong essences of ginger, which while they contained strong spirit were not readily distinguishable, could in this way be easily distinguished. The deep colored specimens referred to might have

been prepared from African ginger, which was very dark, but not of good flavor. His experience confirmed that of Mr. Savage, that if ginger were treated with dilute spirit in the first instance the same result was obtained as by dissolving in strong spirit and then precipitating the resin. But percolation was then apt to fail, because there would be a precipitation of a layer of resin on the surface of the marc which prevented the further percolation. Agitation with dilute spirit and lengthened maceration so as to allow the resin to subside appeared to be the most practical and efficient mode of working.

Mr. Hatch thought it probable that the darker fluid had been prepared from African ginger.

Mr. Groves asked if any one knew the nature of the resin which was rejected by the proof spirit.

Dr. Symes said he had never examined it.

Mr. Groves said he should imagine that the essence of ginger as made by Mr. Thresh was not quite so pungent as that made by maceration, which would contain the whole of the resin.

Professor Attfield said it had been affirmed that the flavor of the ginger resided in the oil, and the pungency in the resin. If that were so it would follow that if the resin were removed the pungency would be reduced to a similar extent; but then, as Mr. Thresh hinted, there might be two resins, one of which was pungent and the other not. He should suggest that Mr. Thresh examine the matter further, for he was evidently well fitted to carry out an investigation of this kind.

Mr. Draper referring to the remark of Mr. Umney that oil of ginger was quite a different preparation, said essence prepared from it did not give the same results as that obtained from the ginger itself. The oil of ginger came from Germany, and was said to be distilled from the ginger root. No varieties were given, but neither essence nor syrup of ginger could be made from it. Why this should be if the whole flavoring resided in the volatile oil was not quite clear. On the other hand, it did not seem to reside in the resin, because with this formula sixteen ounces of tincture were taken and added to twenty-four ounces of water, therefore necessarily precipitating the whole resin. What was left was certainly of considerable interest to pharmacists to determine. He took rather an exceptional interest in the subject, and should be glad if it were further investigated.

Mr. Abraham said the specimen of syrup furnished seemed to him very deficient in aroma although not in pungency.

Mr. Sumner said there was room for a great deal more research with regard to extracting the properties of ginger. One of his sons had given a great deal of attention to the subject, and his experience up to the present time had been that the pungency was in the resin, and the aroma in the soft part. Ginger might be separated into two distinct kinds, the soft floury ginger and the resinous, and his son had found that he got the aroma in the soft ginger, and the pungency in the resinous. With regard to the flavor no ginger could give the same flavor or anything approaching it as the Jamaica.

The President, in moving a vote of thanks to Mr. Thresh, said it seemed to him that the subject might be divided into two portions. If the object of the investigator was to get a preparation which was perfectly soluble in water that was one thing; but if it were to produce a mixture which should dissolve all the characteristic properties of the drug and produce them in a fluid form, that was another question altogether, the latter being by far the most interesting as it came into the category of inquiries which he rather thought in the future would attain more interest than they had up to the present time. Many present would be familiar with some work of Dr. Squibb, in which he had been endeavoring to show that almost every drug should be treated with a different menstruum. That seemed to be the tendency of Dr. Squibb's investigation, and already some curious results bearing upon it had been brought out. He should be disposed to think the ultimate analysis of ginger was still to be made. As far as obtaining simply a preparation soluble in water the problem was not a very difficult one, and Mr. Thresh seemed to have pretty well worked it out.—*Phar. Jour. and Trans.*, Aug. 31, 1878.

NITRITE OF AMYL.¹

By D. B. Dorr.

Nitrite of amyl is now admitted to be an important remedial agent, having taken its place in the national Pharmacopœia. Being a substance of great physiological activity, it is highly important that it should be obtained pure, or if that is impracticable that the preparation

¹ Read before the British Pharmaceutical Conference.

should be of constant strength. With the view of ascertaining whether either of these conditions holds good with the article in the market, I procured several samples from such sources that they may be regarded as fairly representative and submitted them to examination along with a quantity (a) prepared by ourselves. As there is considerable divergence in the boiling point of amylic nitrite as given by different authorities, the fraction 90°-100°C. was collected as correct. This portion had invariably the proper spec. grav. of .877. The results of the examination are embodied in the table annexed.

Sample	A	B	C	D	E	F
<i>Specific Gravity,</i>	.877	.876	.864	.875	.875	.875
Below 90°, . . .	5.0	3.0	34.6	2.6	0.0	52.0
90°-100°, . . .	85.0	65.0	6.7	47.5	11.5	33.3
Above 100°, . .	8.0	28.0	51.7	45.7	83.9	11.4
Water,	0.0	0.0	1.8	0.0	2.2	0.0
Loss,	2.0	4.0	5.2	4.2	2.4	3.3
	<hr/> 100.0	<hr/> 100.0	<hr/> 100.0	<hr/> 100.0	<hr/> 100.0	<hr/> 100.0

These figures give the results of a single rectification. Of course, on again rectifying the lower and higher fractions an additional quantity of nitrite of amyl would be obtained; but the numbers are sufficient for the purpose of comparison. The samples C and E are of very poor quality, E being probably the inferior, because, although it apparently contains a larger percentage of amylic nitrite than C, it yields a large proportion boiling above 100°, the temperature rising to 230° before the distillation was stopped, leaving a black oily residue in the flask. The odor of this sample was quite different from that of genuine nitrite of amyl. It will thus be seen that out of five specimens examined, two were of very inferior quality. That it is difficult completely to separate the nitrite of amyl by rectification from the accompanying substances is shown by the numbers here given. The fractions boiling below 90° and above 100° from the sample F were rectified together in the same way as before, the process being repeated twice.

I.	59.0 cc.	gave 13.0 cc.	= 22.0 per cent.	90°-100°
II.	43.0	8.0	= 18.6	
III.	33.5	5.0	= 14.9	

In passing judgment, however, on such a substance as nitrite of amyl, the question meets us at the very outset, What degree of purity have we a right to expect in this body? In the case of amylic nitrite the ques-

tion is one of considerable difficulty, requiring for its elucidation the consideration of a number of facts. In the first place, I have ascertained that the fractions boiling below 90° and above 100° are for the most part either physiologically inert or have an action distinct from that of nitrite of amyl. There may, however, be several isomeric or metameric nitrites, whose boiling points differ and yet whose physiological action is the same. That this is the case seems probable from the varying boiling points given for amylic nitrite and amylic alcohol. Indeed two isomeric alcohols are known to exist. According to the authorities cited in Watts' "Dictionary," the boiling point of the nitrite varies from 91° to 96° . Tanner ("Year-Book of Pharmacy," 1872, 186) gives 95° - 100° and Umney ("Pharmaceutical Journal" [3], i, 422) 98° - 100° as the temperatures at which nitrite of amyl should distil. For amylic alcohol Gmelin gives boiling points varying from 127° to 134° , and even the more recent researches record apparently conflicting accounts. Schorlemmer found ("Proceedings of the Royal Society," xv, 131) that amyl alcohol, whether prepared from fusel oil or from American petroleum, boiled at 132° . On the other hand, Pedler ("Chemical Society's Journal" [2], vi, 74) gives 128° and 129° as the boiling points of the dextrogyrate and optically inactive alcohols, respectively. Without going further into the matter at present, I may say with certainty that there is an amylic alcohol or mixture of alcohols boiling at 128° - 129° . This I have proved by rectifying a fraction repeatedly until it distilled entirely at 128° - 129° , and then oxidizing the same with potassic anhydrochromate and sulphuric acid. It gave a yield of valerianic acid equal to 14 per cent. Other matters that have to be taken into account are possible inapplicability on the large scale of a process of preparation or purification that may work well in the laboratory, also that a sample honestly prepared by one method may contain impurities not existing in a sample prepared by another process. Not much importance need be attached to the spec. grav., as, on account of the lower fractions having a higher, and the higher fractions a lower spec. grav. than amylic nitrite, it is easy by a judicious blending to produce the desired density.

For the preparation of the nitrite two processes are given in the Pharmacopœia, "by the action of nitric acid or nitrous acid (N_2O_3) on amylic alcohol." Of these two I have no hesitation in pronouncing the latter to be the better. Whether it is the more economical may

be open to question. The objection of Hunge, quoted in the "Year-Book of Pharmacy," 1871, 225, that by this process a black non-volatile substance and a number of other impurities are formed, is unfounded. After passing the gas through for a sufficient length of time, the liquid is agitated with water, decanted therefrom and shaken up with sodic carbonate. The nitrite is now rectified, the portion passing over between 90° and 100° being retained. The amylic nitrite thus obtained has a spec. grav. of .877. By repeated rectification, however, I have never been able to get more than 95 per cent. of distillate. This arises partly from loss in the distillation, but chiefly from decomposition which then occurs, there invariably remaining a residue boiling above 100° . The fact that decomposition does take place is proved by observing that while the liquid before distilling is quite neutral to test-paper, the distillate is strongly acid.

The results of one experiment are here given :

60.0 cc.	gave	52.5 cc.	=	87.5 per cent.,	boiling at 90° — 100°
52.5		49.5	=	94.2	
49.0		46.5	=	94.8	
46.5		44.0	=	94.6	

Considering all the circumstances of the case it will readily be allowed that the fixing of a standard of purity for nitrite of amyl is, in the present state of our knowledge, a matter of difficulty and that it must be to a certain extent arbitrary. The British Pharmacopœia describes the liquid in question as boiling at 205°F. or 96°C. I can only say that no sample we have ever examined, whether purchased or prepared by ourselves, boiled constantly at that or at any other temperature, nor have I any reason to believe that such a perfect preparation has been produced. It is not, of course, for me to decide what tests medicinal amyl nitrite ought to answer ; but I think it will be generally agreed that such products as those marked C and E are not altogether creditable to the profession of pharmacy.

Mr. Umney expressed his regret that nitrite of amyl was not to be found in a purer state now than it was seven years ago, when he went over precisely the same ground as that covered by the present paper. The physiological action of the nitrites of methyl, ethyl and amyl had been thoroughly worked out by Dr. Richardson. He believed that the *sine quâ non* in the manufacture of pure nitrite of amyl was a definite body, amylic alcohol, to start with, not ordinary fusel oil.

Professor Tichborne was very glad to find that Mr. Dott had confirmed a fact which he noticed many years ago in a work called the "Laboratory," which was afterwards denied by Mr. Chapman, one of the main authorities on nitrites. He then pointed out that nitrite of amyl was dissociated in the act of boiling into amylic hydrate and nitrous oxide gas; this was denied, as he had stated, by Mr. Chapman, and he was glad to find that recent experiments confirmed his observations.

Mr. T. B. Groves asked if Professor Tichborne had tried distillation *in vacuo* or in carbonic acid, so as to be out of contact with air.

Professor Tichborne said that at the time he performed the experiment he tried carbonic acid, and that had no effect; but he was not prepared to say what would be the result of distillation *in vacuo*. He fancied that the dissociation of the molecules was really a matter of temperature, and as distillation *in vacuo* could be carried on at a much lower temperature, that dissociation might be brought to *nil* or almost so.—*Phar. Jour. and Trans.* [Lond.], Aug. 31, 1878.

VARIETIES.

A Method of Distinguishing Gallic, Tannic and Pyrogallic Acids. By Wm. Watson, F.C.S.—To about $\frac{1}{2}$ grain of each acid in a little water add NH_4HO .

<i>Gallic.</i>	<i>Tannic.</i>	<i>Pyrogallic.</i>
Pink, rapidly changing to deep orange solution.	Same as gallic.	Lemon-colored solution.

To each ammoniacal solution add HNO_3 .

<i>Gallic.</i>	<i>Tannic.</i>	<i>Pyrogallic.</i>
Red.	Purple precipitate insoluble in excess.	Red.

Substituting HCl for HNO_3 .

<i>Gallic.</i>	<i>Tannic.</i>	<i>Pyrogallic.</i>
Red.	Pink precipitate soluble in excess.	Pink, quickly changing to red.

—*Phar. Jour. and Trans.*, July 20, 1878.

Process for the Detection of Alcohol in Ethereal Oils. By A. Drechsler.—The author uses a solution of 1 part potassium bichromate in 10 parts of nitric acid of spec. grav. 1.30. The new reagent shows the presence of even the smallest traces of alcohol in ethereal oils, as on its addition there is evolved, along with the specific odor of the oil, the well-known pungent smell of ethyl-oxide, whilst, at the same time, a very characteristic change of color occurs, which is very different, according to the quality of the different ethereal oils, and is best observed by using for the experiment small porcelain capsules shaped like a watch-glass. Five to six drops of the oil in question are poured into a capsule, two or three drops of the reagent are added, and the whole is let stand. In certain oils a remarkably beautiful play of color appears in the mixture.—*Chem. News*, Aug. 9, from *Chem. Zig*.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—The President has issued the following
ANNOUNCEMENT.

The Twenty-sixth Annual Meeting of the American Pharmaceutical Association will be held in the City of Atlanta, Georgia, during the last week in November, beginning on Tuesday, the 26th, at 3 P.M.

In consequence of the general alarm produced by the rapid spread of that terrible scourge, yellow fever, in some of the towns and cities along the Mississippi, the officers and executive committee of the Association, having obtained the consent of our friends in Georgia, concurred in the desirability of postponing our Annual Meeting, which was appointed to be held in Atlanta on the first Tuesday in September, until some time in November. After further consultation with our Southern friends, as well as with many of our leading members in the North, the above date has been fixed on as most likely to meet the convenience of the greater number of those who would be disposed to attend. It is confidently predicted that long before the end of November frosts will have destroyed the germs of the pestilence, so that not the slightest apprehension need be felt of danger in the journey on this account.

I trust that as many of our members as possibly can will make it a point to attend this meeting, even at the risk of a little inconvenience to themselves. By turning out in good force we shall stimulate the progress of pharmacy in the South, and best show our sympathy for our fellow-laborers there in their efforts to elevate pharmacy and pharmacists to a higher position. We shall, also, by availing ourselves of this opportunity, have the privilege of exchanging a week or two of the most unpleasant part of the wintry weather of the North for that of the mild and genial atmosphere of the South. The proximity of the place of meeting to the far-famed winter resorts in Georgia and Florida will no doubt be an additional attraction to many. Let there be a hearty response to the cordial invitation extended by our Southern brethren, and a general rally around the standard of the A. P. A. in the beautiful city of Atlanta.

Applications for membership should be addressed to the Chairman of the Executive Committee, Geo. W. Kennedy, Pottsville, Pa. WM. SAUNDERS, *President*.

The Colleges of Pharmacy in the United States, with the exception of that of California, will have commenced their lecture season by the time this issue will be in the hands of our readers. From what we can learn at this early date there is a very good prospect of a fair attendance at all.

British Pharmaceutical Conference.—The fifteenth annual meeting was held at Dublin, Ireland, August 13 and 14, Mr. G. F. Schacht presiding. After the usual routine business had been transacted, the business of the meeting was continued by the reading of a report, by Dr. Wright and Mr. Luff, of some of the latest results they have obtained in the examination of the *aconite alkaloids*. These results have already been communicated to the Chemical Society, and partially published in its journal. To a great extent they consist of rectifications of those stated in the report presented last year to the Conference. Thus, for instance, it is now reported that the substance to which the name *pseudaconitia* was then applied was not a definite base, but, in fact, a mixture of that base with a decomposition product derived from it by removal of water. Consequently the authors now propose the formula $C_{36}H_{49}NO_{12}$ in place of that which they gave last year as indicating the composition of *pseudaconitia*. This alkaloid is described as crystallizing with one molecule of

water which is separable below 100° . It is now found also that some salts of pseudaconitia are crystallizable; for instance the nitrate, which is described as being obtainable by rubbing the approximately pure alkaloid in a mortar with dilute nitric acid in slight excess. Another result is the alteration of the formula of pseudaconina, the product described last year as being formed by the action of acids upon pseudaconitia. The authors now propose to represent this as $C_{27}H_{41}NO_9$, instead of $C_{27}H_{41}NO_8$. This alteration is of course a necessary consequence of the above-mentioned rectification of the formula of pseudaconitia, if the production of pseudaconina from it is to be represented as consisting in the splitting up of pseudaconitia into pseudaconina and dimethylprotocatechuic acid. That decomposition of pseudaconitia, however, is now described as being accompanied by another alteration, which consists in mere dehydration of pseudaconitia and furnishes a product which the authors call apopseudaconitia. The composition of this substance is represented by the formula $C_{36}H_{47}NO_{11}$. It is described as a base closely resembling pseudaconitia and easily obtained by heating that substance with dilute hydrochloric acid, or with a large excess of tartaric acid solution for some hours. The substance described by the authors last year under the name of pseudaconina as resulting from the splitting up or saponification of pseudaconitia is now reported to have been in reality a product of another alteration. The production of this substance—now termed apopseudaconina and represented by the formula $C_{27}H_{39}NO_8$ —is described as consisting either in the splitting up of apopseudaconitia or in the dehydration of pseudaconina formed by the splitting up of pseudaconitia itself. It is reported not to be formed at all when the temperature is 100° , or rather less, but to be readily formed at 140° . These are very radical modifications of the results reported last year, and they show that the general conclusions arrived at in these researches must be received with very great caution.

Another report on work done with the aid of a grant from the Conference research fund was that presented by Mr. W. A. Shenstone on *Brucia and the Constituents of Strychnos Bark*. The principal facts in this paper also have already appeared in this journal, having formed the subject of a paper read at an Evening Meeting of the Pharmaceutical Society of Great Britain during last session. It confirms Mr. Cownley's negation of Professor Sonnenschein's alleged conversion of brucia into strychnia by the action of nitric acid, and states that the yield of strychnia steadily decreases as additional processes of purification are employed, until it completely disappears. It also admits the important fact, previously pointed out by Mr. Cownley, that commercial brucia frequently, if not always, contains an admixture of strychnia, and the reporter gives a method for the purification of brucia from this contamination. Another point in the report is the statement that false angustura bark does contain a small quantity of strychnia.

This concluded the reading of reports, and the next paper read was *On the Volumetric Estimation of some Official Iron Preparations*, by Mr. H. N. Draper. The preparations referred to in the paper were ferrous arseniate, ferrous phosphate and magnetic oxide, and the point investigated was whether the quantities of bichromate of potash solution ordered in the British Pharmacopœia to be used in the volumetric estimation of these bodies are a fair indication of the products yielded by the Pharmacopœia processes. This the author answered in the negative, and in the dis-

discussion that followed Professor Attfield stated that he had always understood that no such indication was intended by the compilers of the Pharmacopœia.

Nitrite of Amyl was the subject of the next paper, sent by Mr. Dott, which is printed on page 499.

Some *Fragmentary Notes on Opium*, by Mr. B. S. Proctor, followed, in which were discussed the variations in morphia strength of opium and some of its preparations, and the importance of using in pharmacy an opium of standard strength.

In calling attention to a *Soluble Essence of Ginger*, Mr. J. C. Thresh touched upon a theme of considerable interest to the audience. This and Mr. Proctor's paper on the same subject, together with the discussion, is published on page 494, etc.

In a second paper, Mr. D. B. Dott announced that he had succeeded in preparing a crystalline *Hydrochlorate of Beberia*, from the examination of which he hopes to be able to clear up the doubt existing as to the composition of the base.

The *Tritration of Hydrocyanic Acid and Cyanides* and its relation to alkalimetry, was the title of the next paper read, which was by Mr. L. Siebold. The author points out that in using Liebig's process for determining the strength of hydrocyanic acid it is better to use an excess of alkali than a deficiency, but that if exact results are desired they may be attained by using an excess and adding standard normal sulphuric or hydrochloric acid to the mixture at the close of the titration, until the slight opalescence produced by the silver nitrate begins to increase, which will not occur until the excess of alkali has been neutralized. For every cubic centimeter of sulphuric acid required, 0.01 cc. must be deducted from the volume of the silver solution used, and the rest calculated as hydrocyanic acid. A modification of the process was also described for analyzing mixtures of potassium or sodium cyanide and free hydrocyanic acid, as well as its applicability to alkalimetric operations.

In the discussion that followed the reading of this paper, Mr. Williams made an interesting addendum to his paper, read at a former meeting of the Conference, on the power of glycerin to prevent the diffusion of hydrocyanic acid. He stated that a solution, made three years ago, containing 37½ per cent. of hydrocyanic acid, 37½ per cent. of glycerin and 25 per cent. of water, had been found, on testing it a week ago, still to contain about 37 per cent. of the acid.

The importance of the pharmacist acquiring a *Knowledge of Vegetable Histology* was then advocated by Mr. T. Greenish, and its value was demonstrated by reference to enlarged drawings of sections of a sample supplied as senega root, which, from its general appearance and the inferior decoction it yielded, was suspected not to be genuine. A histological examination, however, proved it to be a true root of *Polygala Senega*, although immature, and that its inferior pungency was coincident with a deficiency in the cortical layer which Schneider has shown to be the seat of the active principle.

Mr. T. B. Groves then described a *Miscible Copaiba* that he had obtained by treating Maranhian balsam with a saturated solution of potassium carbonate. It resembled ordinary copaiba in appearance and consistence, but was alkaline, and when shaken with water, instead of floating on the surface it readily formed a white emulsion, more or less stable according to the degree of dilution.

Baycuru, the title of a paper by Dr. Symes, is the name of a Brazilian drug, yielded by the *Statice Brasiliensis*, which the author thinks is worthy of trial in this country.

It is used in Brazil as an astringent and discutient remedy in cases of enlargements and glandular swellings.

Under the cover of a note on *Authoritative Formulæ for Non-Official Preparations*, the junior Honorary Secretary of the Conference, Mr. Bengier, levelled an attack at the recent magisterial decisions in the north, that the sale of a mineral substance under the name of "Violet Powder" is an offence against the Sale of Food and Drug Act. The tone of the paper may be gathered from the fact that the persons convicted were described as men in a highly respectable position, who had suffered pecuniary loss, annoyance and vexation "through failing to recognize as authoritative, formulæ published in Gray's 'Supplement' and similar works." Of course, this is a subject upon which there exists a diversity of opinion, and it threatened to lead to a lively discussion. But the time of adjournment had arrived, and there yet remained one more paper on the list.

A *Perfumed Solution of Iodoform* was the subject of the last paper for the day, by Mr. G. A. Keyworth. This is prepared by shaking tincture of iodine with a fragment of fused potash until the color is removed and covering the odor of the iodoform produced by the addition of eau de cologne or lavender water. The author also speaks of lint that has been dipped in this liquid, and afterwards dried, as being a very good application to indolent sores.

The proceedings on Wednesday were commenced by the reading of a paper on an *Improved Preparation of Ergot*, in which Mr. A. W. Postans recommends one resembling the United States fluid extract in containing glycerin, but without the acetic acid. It is obtained by maceration and percolation of freshly-powdered ergot with a mixture consisting of two parts each of rectified spirit and glycerin and one of water, displacing with water, and evaporating the last runnings in a water-bath so that one ounce of the united products shall represent one ounce of ergot.

The next paper, entitled a *Comparison of the Strength of some of the Cinchona Preparations*, by Mr. C. Ekin, was perhaps the most important and valuable communication read during the session. It was followed by another on the *Assay of Cinchona*, by Mr. J. B. Smith. Mr. Ekin had taken a sample of calisaya bark of good appearance, treated it by De Vrij's method, so as to obtain the total alkaloids, and then prepared from the same bark for the purposes of comparison, a tincture, infusion, decoction and fluid extract. From these results the following percentages of total alkaloids were obtained: bark, 1.96; tincture, 1.89; infusion, 1.31; decoction, 1.26 and fluid extract, only 0.47 per cent. From this it appears that the proof spirit of the tincture had nearly exhausted the bark, the boiling water of the infusion and decoction had taken up about five-eighths, while the cold water of the fluid extract of the British Pharmacopœia took up, or at any rate, only retained about one-fourth. In the discussion, Mr. Umney made some confirmatory remarks as to the waste involved in making the B. P. liquid extract, and Mr. Brady mentioned the significant fact that quinia manufacturers are always ready to buy from pharmacists the residues left in the preparation of fluid extracts. Mr. Umney also remarked on the inferior quality of Calisaya bark now met with in commerce, and said he looked to India or Java for the barks of the future, while Professor Markoe says that even now the East India barks are preferred in the United States.

The next paper, by Mr. Geo. Brownen, was one of practical pharmaceutical interest, as it dealt with the *Recovery of the Emetia* contained in the unsightly deposit that forms in ipecacuanha wine. This may be done, the author says, by making the semi-crystalline mass into a paste with water, which is rendered alkaline with calcined magnesia, dried, powdered and exhausted with alcohol. The alcohol is evaporated, and the crude alkaloid purified by dissolving it in dilute acetic acid and precipitating with ammonia. The emetia is thus obtained tolerably pure, as a fawn-colored powder. Mr. Brownen also suggests whether the uncertainty and partial inertness of old ipecacuanha wine may not have another cause in the conversion of the emetia into the gallo-tannate of the alkaloid, which, according to Watts, is "neither emetic nor poisonous."

In a lively paper on the *Adulteration of Drugs*, Professor Tichborne quoted several instances of adulterated drugs that had come under his notice, some of them being substances of such low price as to appear hardly to allow of gain being made by their sophistication. Although the author stated that the gathering of the materials used in the paper had gone on during many years, and indeed some of them are hardly to be met with now, a vigorous and well-founded protest was uttered by Mr. Boileau and succeeding speakers against any inferences being drawn from it or from some remarks made by Dr. McSwiney adverse to the commercial morality of the drug grinders or druggists of Dublin. The paper gave rise to the most prolonged discussion that took place during the Conference, in the course of which more than one speaker expressed an opinion that the subject had been treated in a somewhat exaggerated and one-sided manner by the author.

A method of distinguishing the presence of *Carbolic Acid* or *Cresylic Acid* in *Creasote* was then described by Mr. A. H. Allen. The necessity of including cresylic acid was explained on the ground that if wood tar creasote were adulterated with coal tar acids, not pure carbolic acid would be used, but a low class product containing a considerable quantity of cresylic acid, which in many respects behaves more like creasote than carbolic acid. The method is based upon the difference in the boiling-points of these bodies and the difference of the solubility in glycerin and in collodion.

Two papers by Mr. R. Reynolds and Mr. C. H. Bothamley followed. The first referred to the pink coloration produced in *Orange Flower Water* by *Nitric Acid*, which the authors had found was no longer produced when the essential oil had been removed from the water by ether. The question was started during the discussion as to what ought to be dispensed when orange flower water is ordered in a prescription, the "triple water," as imported, or diluted. Some diversity of practice was disclosed, dependent apparently upon the speaker looking upon the water as being ordered simply as a flavoring agent, or possibly for its hypnotic properties. The other paper, by the same authors, was a report on the *Examination of Various Samples of Dialyzed Iron*. Mr. Gerrard communicated the results of an investigation of the New Zealand drug "pituri," and announced that he had succeeded in separating from it an alkaloidal substance, which he thinks will probably prove to be the active principle and proposes to call "pituria." Mr. Gerrard also commu-

nicated a method of *Preparing Phosphorus Pills*, in which he takes advantage of the density of chloroform vapor to preserve the phosphorus from contact with atmospheric air during the manipulation of the pill mass

In the next communication, Mr. C. W. Fletcher described an interesting compound which has the composition of a *Triiodide of Bismuth and Hydriodate of Quinia*. This was followed by some *Laboratory Notes* by Mr. H. Barton, and the reading of papers was brought to a close by a note on Reichert's *Improved Thermal Regulator* by Dr. Symes.

The Conference then turned its attention to the arrangements for its next meeting, and Mr. Ward, on behalf of the pharmacists of Sheffield, gave a hearty invitation to the members to meet next year in that town. This it was decided to accept. The election of officers, Mr. Schacht being again chosen President, and the passing of various votes of thanks brought the meetig for 1878 to an end.—*Phar. Jour. and Trans.* [Lond.], Aug. 17, 1878.

EDITORIAL DEPARTMENT.

The American Pharmaceutical Association.—For a number of years past we have been enabled to give in the October number of the "Journal" an account of the annual meeting of the American Pharmaceutical Association, which was usually held during the month of September. The causes which have led to its postponement this year are familiar to all our readers. The yellow fever, though abating in severity, is still carrying off its victims, but with the season near at hand when frosts may be expected even in many portions of our Southern States, the scourge will doubtless have spent its fury before another month has passed, and not only be on the decline, but have disappeared from most, and let us hope from *all* the infected districts.

The Association resolved to meet this year in the heart of the Southern States, with the view of enlisting the active co-operation of the pharmacists and druggists of that section of our country. That object would have failed if the meeting had been held at a time while sections from which a large attendance had been confidently expected were suffering from the visitation of that terrible plague. But the reasons why the national Association should go South are still the same, and the necessity is, if possible, still more urgent than it was a year ago. We are pleased to learn that this view is gaining more ground in all sections of the country, and that members who were rather inclined to forego the pleasure of meeting their associates, on account of the distance, are endeavoring to arrange their affairs so as to permit of their temporary absence from their homes and their pursuits at a season when they were usually at their posts of duty. It is the conviction which is gaining ground that it is no less a duty to further the objects and interests of the Association, and that this duty is more imperative now, when that beautiful section of the North American continent, whose interests were to be specially enlisted, has been suffering to so great an extent. The warm sympathy which fills every heart will show itself, we have reason to hope, in an increased attendance from the East-

ern, Middle and Western States, and it is particularly desirable that all those who may have been appointed delegates should be present. The Secretary has already received many letters from members signifying their intention not only of going themselves, but likewise of urging the lukewarm to remove the little obstacles which may be in the way and threaten to interfere with the visit to Atlanta. Many ladies are expected to accompany the members and delegates, and there will be no difficulty in arranging pleasant excursion parties by those who feel a desire to visit one of the fairest sections of the South at a season when in the more northern States the severity of the wintery season is already beginning to be felt.

While we, therefore, on the one hand, look confidently for agreeable social enjoyment in company with the friends of the Association, we believe also that the intellectual treat will well repay a visit to Atlanta. Many reports and papers of scientific and general interest will be read; several members who it was feared would be prevented from coming if the meeting was held later than September will be present, and the exhibition of objects of pharmaceutical interest is promising to prove quite an attraction; a valuable contribution to this meeting will be a collection of California drugs which have been forwarded by Mr. J. G. Steele, of San Francisco, and we hear of other exhibits being prepared in various places besides those which have already been forwarded and have been in the custody of the Local Secretary for more than a month.

In referring to the official announcement of the President, which we print in another place, we take occasion to urge upon the members living in the Eastern, Northern and Western sections to rally in force and now begin the preparations for a visit to Atlanta on the 26th of November. They may be sure of a hearty Southern welcome.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Elementary Quantitative Analysis. By Alexander Classen, Professor in the Royal Polytechnic School, Aix la-Chapelle. Translated, with additions, by Edgar F. Smith, A. M., Ph.D., Assistant in Analytical Chemistry in the Towne Scientific School, University of Pennsylvania. Philadelphia: Henry C. Lea, 1878. Pp. 328.

Classen's little work on quantitative analysis has deservedly met with much favor, as being well adapted for the introduction into that difficult branch of chemistry, viz., the complete separation of the different elements from one another, in such combinations that each may be correctly determined by weight. The method chosen by the author is that of teaching by means of examples, commencing with simple compounds, followed by methods of separation, the determination of alloys, minerals, waters, ashes and a number of products largely employed in the arts. From this brief sketch it will be observed that the work is in the first place intended as an aid to the student on his first entry into the department of quantitative analysis; at the same time, however, it will be found a useful work of reference to the more advanced student and to the practical analyst, inasmuch as it points out processes and methods of separation which may find frequent application. While the

work is not intended to supplant the larger ones by Fresenius, Rose and others, it serves the important purpose of leading to their better appreciation.

The translator and editor has carefully attended to the task before him, and the publisher has given the work an attractive garb, not the least useful of which are the wood-cuts in illustration of apparatus and processes.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By Robt. Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Parts 31 and 32. Philadelphia: Lindsay & Blakiston, 1878. Price per part, \$2.

The two parts before us contain excellent plates, with descriptive text of the following medicinal plants: *Alpinia officinarum*, *Hance* (Galangal); *Astragalus gum-mifer*, *Labill.*; *Butea frondosa*, *Koen.*; *Carum* (*Ptychotis*, *D. C.*) *ajowan*, *Bentl.*; *Citrus bergamia*, *Risso*; *Copaifera Langsdorfii*, *Desf.*; *Garcinia indica*, *Choisy* (oil of mangosteen); *Juglans cinerea*, *Lin.*; *Manihot utilisissima*, *Pobl.*; *Pilocarpus pennatifolius*, *Lem.*; *Pinus balsamea*, *Lin.*; *Pinus tæda*, *Lin.*; *Quercus alba*, *Lin.*; *Quercus tinctoria*, *Bartr.*, and *Zingiber officinale*, *Roscoe*.

The Antagonism of Therapeutic Agents, and What it Teaches. By J. Milner Fothergill, M.D. Philadelphia: Henry C. Lea, 1878. Pp. 160.

The Fothergillian gold medal of the Medical Society of London for 1878 was awarded to this essay, which will be found highly interesting to the observers and inquirers into the antagonistic action of toxic agents. The work commences with accounts of experiments tending to illustrate the subject, and follows this up by critical inquiries into the action of poisonous drugs. The application of the results of these inquiries in cases of actual poisoning and in ordinary practice concludes the author's task.

The essay is tersely written, and contains many practical hints and suggestions.

Bibliotheca Medica. A Catalogue of American and British Books, Periodicals, Transactions, etc., relating to Medicine, Surgery, Dentistry, Pharmacy, Chemistry and Kindred Subjects. Cincinnati: Rob. Clarke & Co., 1878. Pp. 244. Price, 25 cents.

This pamphlet, we think, will be welcome to many of our readers, embracing as it does a list of the titles, together with the price of the works published, as stated on the title page. The whole is classified by subjects, and this is followed by an index by authors.

Pocket Therapeutics and Dose-Book, etc. By Morse Stewart, Jr., B. A., M. D. Detroit, Mich., 1878. Price, 50 cents.

This little book of 100 pages may be conveniently carried in the vest pocket, and will, we think, be found useful by those who need a remembrancer on the subject of doses and uses of even the most ordinary medicines. In our opinion it belongs to that class of books which are very useful to those who make the compilations for their own use.

Berberidaceæ. By C. G. and J. U. Lloyd. Cincinnati, 1878, Pp. 16.

A brief account of the medical and pharmaceutical properties of American berberidaceæ.

Arbeiten aus dem Pharmaceutischen Institute der Universität Dorpat, 1878.

Notes from the Pharmaceutical Institute of the University of Dorpat.

The pamphlet before us contains investigations on theobromina by O. Donker and C. Treumann, and an analysis of the bulbs of *Erythronium dens canis*, Lin., by Prof. Dragendorff.

Méthode d'Extraction des Pigments d'Origine Animale. Applications diverses du sulfate d'ammoniaque. Par C. Méhu. Paris. Pp. 7.

Method of Extracting Pigments of Animal Origin.

The essay was read before the French Academy of Medicine.

Address delivered before the American Medical Association at its Twenty-ninth Annual Session, held at Buffalo, June, 1878. By T. G. Richardson, M.D., of New Orleans, President. Pp. 21.

The American Medical College Association. Second Annual Meeting, held at Buffalo, N. Y., June, 1878. Pp. 10.

The Etiology and Prophylaxis of Blindness. By Dr. M. Landesberg, Philadelphia. New York: Wm. Wood & Co. Pp. 43.

Zur Statistik der Linsenkrankheiten. Von Dr. Landesberg, Philadelphia. Cassel: Theo. Fischer. Pp. 19.

Statistics of Diseases of the Lens.

Upon the Treatment of Strumous Disease by what may be called the Solfataræ Method. By Hor. R. Storer, M.D., Newport, R. I. Cambridge, 1878. Pp. 10.

OBITUARY.

ALFRED DAGGETT, JR., has departed this life in the prime of manhood. He was a prominent pharmacist of New Haven, Conn., and one of the founders and officers of the Connecticut State Pharmaceutical Association and a member of the American Pharmaceutical Association.

WILLIAM S. FOLGER died after a very short illness at Boston in the forty-third year of his life. He was born in Nantucket in 1836, was apprenticed to Dr. Jenks, of Boston, in 1851, and started in business on his own account ten or twelve years ago. He has been connected with the Massachusetts College of Pharmacy for about the same length of time and has served that institution for several years as an officer; at the time of his death he was vice-president. He was a member and officer of the Boston Druggists' Association and a member of the American Pharmaceutical Association. The deceased leaves a wife and two children; his mother and an older brother also survive him.

THE AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1878.

NOTE on PHENOL-PHTALEIN as an INDICATOR in TITRATIONS.

By CHARLES W. DREW, PH.B.

The want of a delicate and reliable indicator for use in volumetric determinations of acid and alkali has long been felt by analytical chemists and practical pharmacists. To those indicators, such as litmus, turmeric and cochineal, which have been most extensively employed, there have been numerous and valid objections based upon the facts that they are colored in both acid and alkaline solutions, and that the transition from one color to the other was appreciably gradual, and hence introduced a source of error into analytical operations, which could be avoided, and then only partially, by continued practice with uniform solutions.

Within the past few years several substances, as fluoresceïn, rosolic acid, neutral salicylate of sodium and iron, anthocyan, etc., have been proposed as substitutes, but all have met with objections either from their rarity, and consequent high price; from the fact that the changes in color were not marked at *exactly* the point of saturation, or else on the ground that the reaction was not characteristic of acids and alkalies alone—other substances producing similar changes in color.

My attention was lately directed to a substance, *Phenol-Phtaleïn*, which was discovered a few years ago by Baeyer and whose general properties were briefly described by Dr. E. Luck ("Ber. d. Deutsch. Chem. Ges.," 4, 658). This substance seems to the author to, in a great degree, meet the wants of analysts who desire an extremely delicate and reliable indicator.

The *neutral* and *acid* solutions of this substance are *entirely colorless*, and by the faintest excess of *alkali*, an *intense carmine color* is developed. This color is discharged with equal readiness by the addition of sufficient *acid* to render the solution *neutral* in reaction.

The mere fact of the transition being from a colorless solution to one of a high color, gives it a great advantage over any of the test solutions in common use, and to this we may add, that for delicacy, tenuity and quickness of response to infinitesimal amounts of acid or alkali, it is immeasurably superior to them all.

The substance is best employed in solution in alcohol of 20 to 25 per cent., and of a 1 per cent. solution 4 or 5 drops are ample for 50 to 100 cc. of the solution to be titrated. However, the strength of the solution is immaterial, and the proper amount to be added can readily be found by one or two trials. In accurate work it will always be necessary to add a few drops of alkali, to render the solution exactly neutral as the Phenol-Phtalein, when dissolved, has an acid reaction.

In order to illustrate the delicacy, I will give, briefly, the results of some few experiments upon it: 0.05 gram of Phenol-Phtalein dissolved in 25 cc. of 95 per cent. alcohol, the acidity counteracted by the addition of 1.75 cc. of decinormal solution of sodium hydrate, when made up to 200 cc. with distilled water, contained of Phenol-Phtalein in each cubic centimetre 0.00025 gram.

0.5 cc. of this solution = 0.00125 gram of Phenol-Phtalein was made up to 250 cc. with water, and .5 cc. of decinormal solution of sodium hydrate, = .002 HNaO, was added; a very distinct pink color was given to the solution, although it represented only 1 part of Phenol-Phtalein in 2,000,000 parts of solution.

An increase in the amount of test solution decreased the amount of alkali required to develop the same shade of color as well as the amount of acid necessary to discharge it. 5 cc. of the test solution = 0.00125 gram of Phenol-Phtalein, when made up to 250 cc. with water was colored a brilliant carmine by 0.2 cc. of decinormal sodium hydrate = 0.0008 gram of HNaO, or 0.02 cc. of normal solution of Sodium Hydrate. This color was completely discharged by the addition of 0.2 cc. of decinormal oxalic acid = 0.00126 gram of $C_2H_2O_4$, or 0.02 cc. of normal solution of oxalic acid. This proportion represented 1 part of the substance under examination in 200,000 parts of solution.

It is, of course, impracticable to work with such minute amounts, yet the experiments serve to demonstrate that the delicacy of the indicator is much beyond appreciation by ordinary apparatus and with solutions of the strengths commonly employed.

I have made a large number of titrations of various solutions, and have never found the indicator to work other than satisfactorily. The color is developed by all alkalis and discharged by all acids, including carbonic acid, hence it is, like litmus, unfitted for use in the titration of carbonates in the cold.

Upon thorough trial I regard this as very greatly superior to any other indicator in use for acids and alkalis, and consider that it deserves a prominent place among reagents for volumetric analysis.

Brooklyn, N. Y., October 4, 1878.

A NEW EXCIPIENT FOR PILLS.

BY RICHARD V. MATTISON.

Read at the Alumni Meeting, Philadelphia College of Pharmacy.

We have received from our friend Mr. Wm. J. Martin, of Cincinnati, Ohio, a gentleman of very large experience in the actual work of dispensing, and having at his command one of the most perfectly arranged prescription departments in the country, some notes on an excipient for pills, designed to be used as an almost universal excipient in the preparation of the varied assortment of the pills daily prescribed.

Its advantages are, first, ready solubility; second, small bulk; third, unusual plasticity and adhesiveness; fourth, body. By the latter we mean that it has an inherent quality of being able to hold itself up, and further, this quality prevents the falling or flattening common to pills containing heavy substances, as calomel, subnitrate of bismuth, acetate of lead, &c. This of itself is most desirable, and becomes extremely so in relation to the small bulk of the excipient required in the preparation of a suitable mass. Its only disadvantage, seemingly, is color, it producing with white powders a colored mass, which, with quinia and similar alkaloids, may preclude its use, since it is the fashion to have these prepared as light-colored as possible. The excipient recommended by Mr. Martin is made by taking one part of powdered gum tragacanth and seven parts of powdered elm bark, and using either water or syrup, preferably the latter, to make the excipient of the requisite plasticity. The boxes exhibited here contain pills made according to the formulæ below, and were prepared, with the exception of the quinia pills, in June last. The quinia pills were made early in the present year, being about ten months old. Pills usually difficult of preparation have been selected, and we are assured no difficulty is found

in preparing them with the above excipient. The pills that have become hard will be found of easy disintegration and ready solubility, and for these reasons is the excipient a desirable addition to the dispensing counter :

Number of Box.		Weight of Materials.	Weight of Excipient.	Number of Pills.
1	Quevenne's Iron .	60 grs.	8 grs.	30
2	Ferri Sulph. Exsic.	60	6	30
3	Bismuth. Subnit.	120	6	24
4	Pyrophos. Iron .	72	8	26
5	Citr. Iron & Quin.	60	8	30
6	Asafoetida (U.S.P.)	96	4	24
7	Blaud's	60	3	30
8	Camphor, 30 grs.) Acet.lead, 15)	45	3	15
9	Camphor, 24 grs. { Capsicum, 24 {	48	6	24
10	Camphor, 30 grs. { Ex.Hyosc. 30 {	60	3	30
11	Calomel	60	3	20
12	1, 2 and 5 gr. Quinia Pills.			

Philadelphia, Tenth month 4th, 1878.

CHAMBERSBURG HYDRANT WATER.

BY THOMAS CANBY CRAIG, PH.G.

Abstract from an Inaugural Essay.

The town of Chambersburg, Pa., is supplied with water drawn from the Conococheaque creek, the origin of which is in the South Mountain, about fifteen miles to the eastward.

After skirting the base of the mountain for some distance, this stream changes its course and flows through a fertile and well-cultivated section of country, through iron, lime and sandstone land.

As no manufactories are situated along its banks that would in any way unfit it for domestic use, it was considered to be as pure water as was accessible.

The water is pumped directly from the creek—no dam or forebay being used—into a reservoir, and is thence conveyed to different parts of the town through cast-iron pipes.

The specimen examined was collected on the 21st day of August—a time of year in which farmers are hauling manure upon the fields, which, with the old hay and straw left from harvesting and dead weeds and falling leaves, forms decomposing heaps, parts of which are naturally washed into the creek by heavy rains, prevalent at this season.

A preliminary *qualitative* examination was first made, and afterwards one liter of the water was carefully evaporated and the residue dried at 110°C.; it weighed .090 gram. The free carbonic acid and ammonia were determined separately. The results were as follows:

Iron, . . . . .	.0126 grams,	14.00 per cent.
Alumina, . . . . .	.0029	3.22
Silica, . . . . .	.0055	6.11
Calcium, . . . . .	.0209	23.22
Magnesium, . . . . .	.00908	10.08
Potassium, . . . . .	.0067	7.44
Sodium, . . . . .	.0016	1.78
Sulphuric acid (SO ₄),	.0077	8.55
Phosphoric acid (PO ₄),	.00509	5.65
Carbonic acid (CO ₂), .	.015	16.66
Chlorine, . . . . .	.00215	2.38
Organic matter,00125	1.38
<hr/>		
Total,	.09047	100.52
Total residue,	.09	100.00
<hr/>		
Gain due to error,	.00047	0.52
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Free carbonic acid, gram	.02	
Free ammonia,0004	

Temperature of the water, 22°C. Hardness, 3.45°.

This water must be regarded as very pure and highly fit for domestic use. It contains a small proportion of free ammonia, about 4-10 milligram in a million, and but one and thirty-eight hundredths per cent. of organic matter in the solid residue, which is not sufficient to produce enough free ammonia, even in the summer months, to render it unfit for drinking purposes.

Phosphoric acid does not usually exist in such a large proportion, seldom more than a mere trace being found in river waters. But we may account for these phosphates in this instance from the fact that the stream flows through a highly cultivated section of country—the Cumberland valley—and receives much of the fertilizing substances which the farmers put on their fields. These fertilizers consist largely of phosphates.

The absence of copper, lead and other poisonous metals would further indicate its total freedom from injurious properties.

EXTRACTUM CANNABIS INDICÆ.

BY WILLIAM H. DEPREZ, PH.G.

Abstract from an Inaugural Essay.

The author endeavored to ascertain the quality of commercial extract of Indian hemp from its behavior to solvents. The amount of moisture was first determined by exposing 100 grains of the extract to the heat of a water bath until it ceased to lose weight. The residue was next treated with water until deprived of all principles soluble in this menstruum, and the undissolved portion dried and weighed. A portion of the undissolved residue was then successively treated with petroleum benzin, benzol and alcohol, and in each case the amount of the dissolved matter ascertained. A small residue was finally left, which was found to be insoluble in ether, chloroform, olive oil, oil of turpentine and potassa. The samples examined were: 1, one prepared from gunjah by the process of the U. S. Pharmacopœia; 2, a sample prepared in Germany; 3 and 4, two samples prepared by two different manufacturers in England. Calculated for 100 grains of the original extracts, the results were as follows:

	Loss by Heat.	Soluble in				Insoluble.	Total.
		Water.	Petroleum Benzin.	Benzol.	Alcohol.		
1	1'7	1'5	73'8	18'4	1'4	3'3	100'1
2	1'2	1'7	73'8	17'5	2'3	3'5	100'0
3	10'5	3'4	65'4	16'5	1'4	2'7	99'9
4	2'0	18'8	60'2	15'4	0'9	2'7	100'0

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Codliver Oil.—Th. Husemann compared the medicinal virtues of different kinds of codliver oil with the object of determining the active constituents. He denies the presence of any particular active principle, curing scrophula and lung diseases, and believes that its efficacy is entirely due to the mixture of the glycerides of fatty acids, it differing, however, from other oils in being absorbed and in oxidizing more quickly in the human body. He states on the authority of Professor Almén, who has devoted many years to the analysis and study of the different kinds of codliver oil of commerce, that a nearly white oil may be made by heating fresh codlivers, previously cleaned

and washed, in well-tinned kettles by steam, decanting the exuding oil, straining it and exposing it to a low temperature ; on conveying it afterwards to a warm room, all stearin will crystallize and settle. The oil should then be decanted, bottled and sealed, and may be kept for six years without becoming rancid.—*Zeitschr. Oest. Apoth. Ver.*, Aug. 20, p. 386, from *Pharm. Handelsbl.*

Effect of Food on the Formation of Bone.—Lehmann states that a young pig, fed for 126 days on potatoes alone, was attacked by Rachitis, while the skeleton of others of the same age, supplied with potatoes and phosphates as food for the same length of time, was fully developed, there being, however, a considerable difference between them ; those fed on potassium phosphate had more porous and specifically lighter bones, than those supplied besides with phosphate and carbonate of calcium.—*Chem. Centralbl.*, No. 31.

Alleged Anhydrous Quinidia (Conchinia) Sulphate.—O. Hesse contradicts Petit and De Vrij's statements that commercial quinidia sulphate is nearly anhydrous, and states that the homocinchonidia salt is the only anhydrous sulphate of the cinchona-alkaloids, while quinidia sulphate contains in 100 parts : 82.87 alkaloid, 12.53 H_2SO_4 , and 4.60 water of crystallization ; it loses not more than 1 per cent. water at 100°C ., but parts with all when kept for some time at a temperature of 120°C ., and soon regains it again on being exposed to a moist atmosphere.—*Ber. Deutsch. Chem. Ges.*, 1878, p. 1162.

Milk as a Vehicle for Quinia.—Battersburg considers milk the best vehicle for quinia, and states that 0.06 gram of quinia in 30.0 milk can scarcely be detected by the taste, while 0.12 quinia imparts only a slightly bitter taste to 30 grams of milk, and 0.03 quinia in a tumblerful of milk cannot be tasted at all.—*Pharm. Ztschr. f. Russl.*, August 15, from *Aerztl. Intell. Bl.*

Cinco Folhas and Sparattospermin.—*Sparattosperma leucantha*, *Mart.*, syn. *Bignonia leucantha* Velloz., belonging to the natural order of Bignoniaceæ, indigenous to Brazil, commonly known as *Cinco Folhas* (five-leaf), is described by Dr. Theo. Peckolt as a stateiy, high tree, losing its foliage in July, and obtaining it again in November, its delicate, white blossoms soon turning to a light-violet color ; the fruit ripens in February, and consists of pods as thick as a finger and about

30—40 centimeters in length. The leaves are the medicinal portion of the plant, and are used as tea for liver complaint and kidney diseases with excellent success. Their efficacy seems to be due to *Sparattospermin*, which is obtained by extracting the leaves or twigs with water, boiling, refiltering, evaporating to the consistence of an extract, treating this repeatedly with boiling alcohol (spec. grav. 0.833), evaporating the alcoholic solution to dryness, treating this residue with cold water, and purifying the crystalline powder by recrystallizing from boiling alcohol. *Sparattospermin* possesses no odor, but a bitter alkaline taste, and has the composition $C_{19}H_{21}O_{10}$. It is not a glucoside, and is colored yellow by sulphuric acid.—*Ztschr. Oest. Apoth. Ver.*, Aug. 10, 1878, p. 361.

Copper in Ammonia.—On passing sulphuretted hydrogen into commercial ammonia water, A. Schwalm obtained a blackish-brown precipitate, which on further examination was found to be sulphide of copper. The presence of copper was not indicated by any change of color in the ammonia water.—*Phar. Zeitschr., f. Russland*, Aug. 15, p. 483.

Ammoniated Citrates.—Ed. Landrin reports as the result of a series of experiments, made to determine whether the ammonium salt only serves as a solvent, or combines with metallic oxides, forming double salts, that the citrates of calcium, barium and strontium, being insoluble in water, are soluble in any aqueous solution of ammonium citrate, while magnesium, aluminium, iron, manganese, nickel, cobalt and copper form definite double salts with citric acid and ammonium.—*Chem. Centralbl.*, No. 32.

Oxalic Acid as an Absorbent of Ozone.—Jeremin finds that a considerable quantity of ozone is absorbed by an aqueous solution of oxalic acid, and will keep in this solution for any length of time, becoming more efficient with age as a disinfectant. Gaseous ozone keeps better in contact with air than in the dark. The author prepares a cement from pumice-stone, praffin, wax and rosin, which he claims to be proof against ozone.—*Ibid.*, No. 33.

Vagina globules, frequently prescribed in Germany, consist of a jelly prepared from 1 part of gelatin and 6 parts of glycerin, medicated with potassium iodide, sulphate of zinc, sulphate of copper, etc., and

congealed in suitable moulds. Since tannin cannot be combined with this mass, E. Rennard recommends the use of *Agar-Agar*, a vegetable gelatin made in Japan, principally from *Fucus Amansii*. This contains no nitrogen, and can also be used for culinary purposes. Rennard uses 1 part of Agar-Agar, 10 parts of glycerin and 20 parts of water; the jelly is entirely transparent, while if made of Agar-Agar and water alone (1·30), it is opaque.—*Pharm. Ztschr. f. Russl.*, July 15, p. 417.

Hehner's Method of Butter Analysis.—185 analyses, according to Hehner's method (see "Am. Jour. Pharm.," May, 1878, p. 257), of pure, adulterated and entirely artificial butter, and of different animal fats, have fully convinced Fleischmann and Vieth that pure butter yields a percentage of fatty acids varying between 85·79 and 89·73 per cent. They consider butter yielding 87·5 per cent. or less strictly pure; if the percentage is over 87·5, but does not exceed 89·73, there is a possibility, but not a certainty, of an adulteration.—*Ztsch. f. Analyt. Chem.*, 1878, p. 287.

Starch in Cacao.—Wittstein proved that the starch naturally existing in cacao is so enclosed by the fat and other constituents, that on adding iodine to a clear and filtered decoction of cacao, a blue color will not be obtained. This furnishes an easy method of distinguishing between the natural starch and starchy adulterations, the filtered decoction of which strikes a blue color with iodine —*Ztschr. d. Allg. Oest. Apoth. Ver.*, Sept. 1, 1878, p. 399.

Explosive gelatin, so-called because it resembles gelatin in appearance, was invented by A. Nobel as a substitute for dynamite, and combines the advantages of being 50 per cent. stronger and of not being decomposed by water. It consists of 94 to 95 per cent. of nitroglycerin and 5 to 6 per cent. of collodium, and is particularly adapted for filling torpedoes, etc.—*Pharm. Centralb.*, July 18, p. 271, from *Chem. Ztg.*

Gold and Silver Plating.—(1.) Dissolve 10 grams of gold in 40 grams HCl and 15 grams HNO₃ concentrate and evaporate off the acids as much as possible, precipitate the gold with ammonia, place on a filter and wash. Dissolve 100 grams of potassium cyanide in very little water, and dissolve the gold on the filter in this solution, always returning the filtrate to the filter until all brown particles are dissolved, then add sufficient distilled water to make 1 liter.

(2.) Precipitate 20 grams of silver, dissolved in 60 grams HNO_3 by an aqueous solution of 20 grams of caustic, potassa place on a filter, wash with water, and dissolve on the filter in an aqueous solution of 100 grams of potassium cyanide; add water to make 2 liters.

Both solutions are used by immersing the bright metals which are to be plated into them.—*Ibid.*, July 25, p. 282, from *Ibid.*

THE MICROSCOPE IN MATERIA MEDICA.

BY THOMAS GREENISH, F.C.S.

Vegetable histology is a subject which merits more attention from the pharmacist than it usually receives. The necessity of a general knowledge of botany or the natural history of the vegetable kingdom is fully recognized, but the pharmacist in dealing with the vegetable materia medica requires something beyond and more special than this general knowledge. He should know the organographic locality of the active constituents of the different plants used in medicine and also something of the histological localization or the particular tissue or tissues in which those active principles reside. The anatomy of these elementary parts of which the organs of plants are composed constitutes vegetable histology, and the several cells are distinctly visible and capable of being examined and identified only with the aid of the microscope.

As one instance in point, cinchona bark may be mentioned. Wigand investigated this bark with a view of determining the question which had occasioned some controversy, which of the cell tissues was the seat of the alkaloid? Chiefly through the employment of reagents he came to the conclusion that the alkaloid resided mainly in the bast or liber cells; but the more careful experiments conducted by Carl Müller have settled this question and have placed beyond doubt the fact that the parenchymatous tissue is the seat of the alkaloid in the cinchona bark, and this opinion has, I believe, never since been called into question. The relative proportions, therefore, of bast or liber to parenchymatous tissue in a given sample of cinchona bark, which to a certain extent may be indicated by its short or otherwise fibrous fracture, is an element of some practical value prior to a chemical analysis.

Cultivation, with reference to particular soils, has the property of

determining the development of one tissue at the expense of another; for instance, holly cultivated in a rich soil loses the spiny character of its leaves due to prosenchymatous tissue in the excessive development of its parenchymatous tissue. Some medicinal plants by garden cultivation lose much of their medicinal activity. Schroff states that this is the case with the aconites, and Hanbury mentions that the variation in quantity of volatile oil yielded by valerian is influenced by locality, a dry and stony soil yielding a root richer in oil than one that is moist and fertile, and I have but little doubt that this influence of soil is accompanied by a corresponding alteration in the histological elements of the valerian root.

Facts such as these are very suggestive to the pharmacist, and they may, on a little reflection, be much extended; but they are sufficient to show the value of a study of vegetable histology, without which the influence of soil, climate and cultivation on the development of particular elementary tissues cannot be accurately determined.



A parcel, supplied as senega root in the usual course of business to a pharmacist, was forwarded to me for microscopical examination. Its being a senega root at all was called in question. It will be observed from the sample that the roots are thinner, of a lighter color, and have fewer rootlets than the senega usually met with in commerce. Also the dark concentric rings are not present, and there is an absence of keel, with other characters of lesser importance. A decoction of it, as compared with one from an ordinary sample, is much lighter in color and in taste much less pungent. The histological examination proved it to be a true root of *Polygala senega*; a transverse section of it is represented by No. 1 drawing. No. 2 is a section of a root of a senega of commerce taken across a keel, and showing the general structure to be similar to the preceding. No. 3 is a section of one of the rootlets.

I shall now proceed to describe the tissues histologically. For this

purpose No. 2, a section of the senega of commerce may be taken. The cortical portion or bark of the root is divided into three parts, an outer layer or periderm, composed of a series of two or three tabular cells of a yellowish-brown color; next, a middle layer of thin walled parenchymatous tissue, the outer cells stretched for the most part in a tangential direction. This layer is very unequally developed when there is a keel to the root, as is the case in this section; on that side it is smallest, from there it increases gradually till it reaches the opposite side, where it displaces more or less completely the inner layer, which is the most fully developed on the keel side, where also may be seen the bast or liber cells, and passing through this tissue the medullary rays.

Although the histological elements of these three sections are identical, yet in their relative proportions the three roots differ materially, and to the result of these differences, bearing immediately on the greater or less activity of the root, attention will next be directed.

Senega has probably not received so much attention as other substances of the vegetable *Materia Medica*, but Schneider, in 1875,¹ undertook the determination of the following points: the active principle of the senega root, and what part of the root contained it in the greatest quantity; but with the latter part only we shall have to do on the present occasion. Trommsdorff had, in 1832, stated that the active principle resided in the bark of the root only, and not at all in the woody tissue of the centre, and Schneider confirmed the correctness of his conclusions by analyses of different roots and different parts of the same root. The conclusions he arrived at may be summed up as follows, giving to the active principle of the root the name of senegin.

Rootlets,	9.26 per cent. senegin.
Middle-sized roots,	3.28
Thick roots,	3.02
Crown of the root,	2.6

The central woody portion being inert, I shall pass over that part and not further allude to it, excepting in reference to the space it occupies relative to the parenchymatous tissue, the seat of the active principle. From the conclusions of Trommsdorff and Schneider that the bark only yields the active principle, it will be seen that these sections have an immediate practical bearing on the value of senega root. No. 1,

¹ "Archiv der Pharmacie."

the root in question, has little bark relative to its woody and inert centre. No. 2, a section from a fair sample of the senega of commerce with a keel, has much more bark in proportion to its woody portion, and No. 3, a section of a rootlet, is nearly all bark. Calculating now the superficial area of parenchymatous tissue of the bark which contains the senegin, and comparing it with the prosenchymatous or woody tissue, which is inert, the relative proportions in the three roots will, approximately, of course, stand thus :

Rootlet, 8.5 to 1, (or relatively)	.	.	.	17
Middle-sized senega, 3 to 1,	.	.	.	6
The senega in question, 1 to 2,	.	.	.	2

It will be observed how closely the superficial area of parenchymatous tissue, in which alone the active principle resides, corresponds with the relative proportions of senegin in the roots and rootlets analyzed by Schneider.

These enlarged drawings are to scale and the relative proportions exactly those of the microscopic sections from which they were drawn. It will now be seen why the rootlets yield so much more active principle than either of these roots, and it will at the same time be evident why the sample in question yields a decoction so deficient in strength. Schneider remarks that it would be impossible to obtain rootlets in sufficient quantity to meet the demand for senega, and recommends the use of roots of medium thickness, in accordance with the results of his analyses, and probably if these are well furnished with rootlets, so much the better.

The keel, generally considered an important feature of good senega root, is due to a peculiar development of bast or liber tissue on one side, and the same root may be quite round in one part, and have a development of keel in another ; this keel is shown in section No. 2. Having isolated the elementary organs of a section across this particular part of the root, separated the tabular cells of the epidermis, the cells of the parenchymatous tissue, and also the liber cells represented by these waves in cellular tissue, and examined the individual cells so separated, I have always found that those of the parenchymatous tissue contained granular and oily matter, whilst the liber cells were free from it ; and reasoning from analogous instances I am led to conclude that the liber tissue does not equally with the parenchymatous contain the active principle, and this may probably be the reason why middle-

sized roots, with less liber tissue, yield more senegin than those of larger size.

There is no doubt in my mind but that this root which has been called in question is that of *Polygala senega*, but it is deficient in cortical portion, the seat of the active principle, and is, I believe, a young and immature root, and consequently one that does not fairly represent the senega of our materia medica from which the preparations of the British Pharmacopœia are directed to be made. I think from what I have stated, and demonstrated by drawings from microscopical sections of different roots of senega, it will be seen how important it is that the senega employed in pharmacy should have its cortical portion fully developed, and the same process of anatomical analysis is applicable to almost every drug with which the pharmacist has to deal.

May I indulge a hope that the time is not far distant when vegetable histology, embracing the isolation and microscopical examination of the tissues so isolated, together with the microchemical analysis of the vegetable cell, will take its place by the side of botany in the practical course of study for the pharmacist; when an intimate knowledge of the seat of the active principles of the plants with which he has to deal, and the relative proportions of the special tissues containing those active principles, will exercise its due influence in the pharmacy, be felt in the drug markets, and react on the sources of supply, so that more judgment as to the time of collecting, and more care as to the mode of harvesting, may furnish us with the several drugs of the materia medica in the best possible condition for pharmaceutical preparations.—*Phar. Jour. and Trans.*, September 7, 1878.

MISCIBLE COPABIA.

BY. T. C. GROVES.

Some years ago my brother, Henry Groves (now of Florence), discovered the interesting fact that when a mixture of balsam of copaiba and oil of tartar (a saturated solution of carbonate of potassium) are shaken together and thereby emulsified, the creamy fluid after standing a few days deposits a white crystalline substance, leaving supernatant a clear stratum of apparently unaltered copaiba. It was, however, more or less completely saponified and rendered miscible with water, forming

with it a white emulsion. It therefore differs essentially from that which is known as soluble copaiba.

Since that time the preparation has occasionally been employed here, but as its applications were limited it did not, until the recent papers on copaiba by Mr. Siebold and others appeared, occur to me to examine the reaction.

As it is I have but made a superficial examination of the question, which, in order to do it justice, would require the expenditure upon it of far more time than I have at my disposal.

A sample some six or eight years old of this miscible copaiba (Bals. Copabiæ, Oi; Ol. Tartari, 3ii fl.) presented the following characters:

It was, as I have already said, similar in appearance and consistence to ordinary copaiba, but instead of having an acid it had an alkaline reaction, and when shaken with water instead of floating on its surface as ordinarily it readily formed with it a white emulsion, more or less stable according to the degree of dilution. This emulsion was of course readily destroyed by acids. As regards its behavior towards solvents it differed little from ordinary balsam of copaiba. The only point worth remarking on in this connection was the fact that alcohol did not affect a perfectly clear solution, and caused after a few days a minute whitish deposit to collect at the bottom of the bottle. The removal of this substance (probably a resin-salt of potassium) did not, however, affect the emulsibility of the balsam.

So much for the fluid balsam which had been carefully drained off from the underlying white saline deposit. This was found to be imbedded in a pasty resinous substance on the surface of which were planted numerous crystals, slender needles of from one quarter to half an inch long. The mass having been well washed with benzol these crystals disappeared, and up to now they have refused on the evaporation of the solvent to put in a second appearance. The white substance left after the washing above referred to proved to be entirely composed of minute crystals of bicarbonate of potassium.

The action, therefore, of the acid resins of the copaiba had been this, to deprive two molecules of the carbonate of half their potassium, leaving the second atom to combine with both atoms of carbonic acid and one atom of water to form the acid carbonate of potassium and water known as bicarbonate of potassium. No evolution of gas, therefore, attends the operation. It seems, moreover, that balsam of copaiba

in the cold exerts no action on bicarbonate of potassium. The balsam of copaiba used in making the preparation above referred to was presumably the Maranham variety; it was obvious, however, that as the copaiba balsams of commerce differ as widely in their characters as in their botanical sources it would be desirable to experiment on well defined samples of known origin. I accordingly obtained from Messrs. Barron & Co., of Giltspur street, London, authentic samples of Maranham and Para balsams of copaiba and of Gurgun balsam, and treated them as follows:

In bottle No. 1 were placed $2\frac{1}{2}$ fluidounces of Maranham balsam of copaiba and $\frac{1}{4}$ fluidounce of oil of tartar. A fluid drachm of this yielded on evaporation 34 grains of solid saline residue.

Bottle No. 2 contained Para balsam of copaiba and oil of tartar in the same proportions.

Bottle No. 3 contained Gurgun balsam and oil of tartar in the same proportions.

Bottles No. 4 and 5 contained Maranham balsam of copaiba, adulterated to the extent of 10 per cent., in one case with linseed oil, in the other with Gurgun balsam. It was thought probable that these admixtures would be at once detected when the oil of tartar should be added; but as such was not the case and an opinion on the subject could not be certainly formed before the lapse of several days, I will not further refer to them.

Each of the mixtures well shaken over night showed signs the next morning of depositing. It was not, however, until five days had elapsed that the operation seemed complete.

No. 1 had by that time deposited a whitish layer of bicarbonate; over that lay a thin stratum of viscid resin, on the surface of which floated numerous small needle-shaped crystals; above that came the clear balsam, through which could be seen numerous crystals attached to the sides of the bottle. Neither layer was emulsible, although the lower one showed some tendency that way.

No. 2 differed altogether from the preceding. There was indeed the stratum of bicarbonate, but it was less in volume; the viscid resin was absent; the space occupied in the other case by clear balsam was here cleanly divided into two equal parts, the upper portion containing a pale colored essential oil not miscible with water, the lower portion a sapon-

ified balsam of the usual character, except that it had a little more color.

No. 3 took a considerable time to settle down into three tolerably distinct layers, the lowest portion dark and dense, occupying about one-fourth of the space, the middle of darker color still but less abundant, the upper fluid but both paler and thinner than the original Gurgun balsam. It was not emulsible.

A sixth mixture was now prepared with $2\frac{1}{2}$ fluidounces of Maranham balsam of copaiba and $\frac{1}{2}$ fluidounce of oil of tartar. This comported itself very differently from No. 1. It took much longer time to settle, and during the operation deposited neither crystals nor viscid resin. In fact the whole of the fluid portion was saponified and rendered readily emulsible.

It seems then that in order to prepare a perfectly miscible copaiba, the oil of tartar must be added in proportion to the acid resins present in the balsam, and that experiment only can reveal what that proportion should be.

The peculiar behavior of the Para balsam in contact with the oil of tartar points to the existence of radical difference between it and the Maranham variety. Whether it be anything more than this, that it contains a larger quantity of the essential oil than the saponified resin is capable of dissolving, further experiment must decide. I think it must be something more, as I find the essential oil of the Para balsam is not miscible with the completely saponified Maranham balsam, or with the saponifiable portion of the Para balsam, and it is in my opinion quite a moot point whether the essential oil of copaiba is in any proportion soluble in the saponified balsam. In fact I am inclined to regard the Maranham variety as a balsam, the Para variety as a balsam *plus* essential oil.

There are, I am aware, other varieties of balsam of copaiba known to commerce to which it might be interesting to apply this test, but it would be necessary to be quite sure about the identity and purity of the samples. Balsams of varied origin and also resinified essential oils might also be subjected to experiment.

For administration in capsules this miscible copaiba would seem to offer some advantages over the ordinary balsam. It would mix more evenly with the contents of the stomach, and not float on the surface, causing pain and nausea. Moreover, the alkali present would be bene-

ficial in the class of cases for which balsam of copaiba is usually administered. I have filled a few capsules of gelatin in order to see whether that material would be acted on injuriously by the saponified balsam. I will only add (*miseris succurrere disco*) that they are at the disposal of the members of the Conference, and that any report on their action that I may be favored with shall be treated confidentially.—*Phar. Jour. and Trans.*, [London] Sept. 7.

On the RELATIONS between the ACTIVE PRINCIPLES and the BOTANICAL CHARACTERS of OFFICIAL PLANTS.

BY PROFESSOR A. HERLANDT, Bruxelles.

Translated from "Archiv d. Pharmacie," July ("Jour. de Méd. de Bruxelles," 1878, March), by P. H. Dill, Ph.G.

Are the relations existing between the properties and the physical characters of plants, as observed since the earliest botanical studies, merely coincidental, or are they governed by the laws of natural affinity, which endeavors to systematically associate all living beings?

The only important work on this subject is A. P. DeCandolle's, "On the Medicinal Properties of Plants Compared with their External Characters and their Natural Classification." This, like all his productions, is a masterpiece, which would obviate the necessity of again studying the question, if several circumstances did not compel it.

In the first place, his work dates from a time (1816) when chemistry had not isolated with certainty a single active principle. Very little was known of the analogy existing between families, and the latter themselves, being very deficiently limited, embraced many foreign elements. Notwithstanding that the majority of scientific men accepted the law suggested by Linnæus and extended by DeCandolle, there were some who would either not recognize it at all or admit it very reluctantly. Chief among them I mention J. Chatin, he contradicting the theories of DeCandolle most openly. In his work "On the Seat of Active Principles in Plants," he says: "Apocynaceæ.—Their properties differ greatly according to the species, consequently the celebrated theory of the similarity of the medicinal and botanical characters, which DeCandolle so emphatically supports, has no solid foundation."¹

¹ Chatin makes use of the same law which he rejects, for in the same work he classes the plants in families, and then states their medicinal properties. He admits

It is not my intention to review the work of DeCandolle, but only to investigate some parts of the above interesting question, especially in regard to the limit of comparison which should be observed between the plants and the relative properties of their natural orders.

All authors accept as limit of comparison between plants the action which they exert on the animal organism. DeCandolle found this view of the question deficient, but the state of chemistry at his time warranted no other conclusion.

To establish an analogy, a well-defined boundary must be fixed upon, which in this study cannot be done by examining simply the properties of plants, but rather the nature and properties of their principal constituents.

All really medicinally active plants contain substances which, in most cases, have been isolated and chemically studied. These substances do not always embrace the entire properties of the vegetable from which they are obtained. On the contrary, it frequently occurs that the greatest diversity exists in their respective actions. The cause of this seeming anomaly is generally due to the fact that the activity of a plant represents the action of several bodies possessing different properties; therefore the action exerted on the animal organism by the vegetable is the result of different, sometimes even opposite, influences. This also makes the strongest point against the too eager endeavor of modern therapeutics to replace all plants by their active principles; it is also the principal cause of the difficulty met in the systematic classification of the simple medicinal plants according to their properties.

The importance of the chemical study of plants increases daily; it is the base of rational *Materia Medica*. Analysis is the only safeguard against the flooding of pharmacy by innumerable plants, which, to maintain in or introduce into it, would interest only charlatanism or ignorance. An officinal plant, whose constituents are not known, is nothing better than an empirical remedy.

A very important fact which must be borne in mind is that the properties of the indisputably active constituents are not solely dependent upon the proportion of the elements united in their composition, but also on their molecular constitution. Bodies may be isomeric, have

that the *malvaceæ* are mucilaginous; that the *cruciferaæ* show "a remarkable similarity in their therapeutical properties;" that the *loganiaceæ* contain a poisonous principle—in short, a large number of facts supporting the theory of Linnæus.

the same elements in the same proportions, and yet differ in their properties.

Such perplexing instances are morphia and piperina, thebaia and buxina. Then again, only the slightest difference in the chemical composition alters the properties of the bodies very materially. For example, quinia and emetia, both existing in the nat. ord. Rubiaceæ, differ only provided the formula for the latter is correct, in the latter containing three molecules more water than the first. A still more striking example is offered by morphia and its derivative apomorphia, the former containing only one more molecule of water than the other.

Evidently, there exists a tie between the narcotic papaveraceæ of the genus papaver and the emetic and irritant papaveraceæ of the genus chelidonium and sanguinaria. As known, curare prepared from *Strychnos toxifera*, possesses entirely different properties than the alkaloïds of the other species of *strychnos*; but, by the experiments of Crum-Brown, Fraser, Jolyet, A. Cahours and Schroff, it has been demonstrated that the ethylated and methylated derivatives of *strychnia* act in the same manner as curare. Here, then, chemistry enlightens us on a point which, at first glance, appears to contradict the theory of Linnæus, and which, if the physiological properties were taken as standard of comparison, would be incomprehensible.

We know very little in regard to the laws which regulate the formation of the proximate constituents in the vegetable organism. We know that plants, like all living beings, are chemical apparatuses in active operation; but we know only the products, not the processes to which they owe their origin.

We may infer that oils and fats are more permanent reserve-nutrients than sugar and starch; but when vegetation is again awakened they are changed to soluble nourishments. We may suppose that the etherial oils of flowers are antiseptics, intended to shield their organs from the attacks of lower parasites. We know that the resin with which the buds are coated protects them from moisture; but what more do we know? "Of the entire long list of substances like Coloring-matters, Acids, Alkaloids, Wax, Tannins, Pectin, etc., the relation to other processes of transformation is unknown, as well as the physiological process in the plant life." (J. Sachs' "Handbook of Botany.")

One of the principal consequences of the various reactions occurring

during the life of a plant is the change of the nature and properties of the active principle according to the time at which the plant is analyzed, and according to the organ which is examined. This indicates the necessity of having a specified time—a balsamic period, as the ancient writers have it—for collecting every plant and every part thereof.

We will not here consider the influence of the soil on the chemical composition of officinal plants. This influence certainly exists, but its significance has undoubtedly been overestimated; generally it only regulates the quantity of water absorbed by the plants. If the plant is of an aromatic nature, moist soil and rain will cause it to be less active. In my opinion, the influence of hybridizing and variation is of much more moment. It is very probable that a natural or artificially-produced variety will exhibit a more or less marked difference from the parent type of which it arose. This is only a consequence of the principles of transmutation exemplified by our fruit trees and leguminous plants.

From these observations it follows that to form a limit of comparison between plants, their active constituents must be taken as foundation, and not their properties. This necessitates the entire discarding of all officinal plants whose composition is not satisfactorily established, especially the exotics, whose properties are even sometimes known merely from descriptions. When chemistry shall have made more advancement, when vegetable physiology shall have explained the office of every active substance, then the principles of Linnæus will become more universal and its exceptions reduced to their actual value. The more or less diluted state of the active substances, and the presence or absence of certain anatomical elements, have already shown analogies where they did not appear to exist. If, therefore, the exceptions which were incomprehensible to DeCandolle are viewed from this standpoint they are easily explained. Potatoes, like other solanaceæ, contain solania; cherry-laurel is both chemically and botanically closely allied to the peach and other amygdaleæ. There is not so great a difference, as has been shown by Endlicher and Guibourt, between the properties of colocynth and the more edible fruits of the same order, like melons and pumpkins, only that in the cultivated species the active principle is more diluted by an excess of starch and sugar. Similar is the relation of the sweet-potato and jalap; here the influence of cultivation is clearly demonstrated, and to what extent this influence may alter plants is

well known. It is also the case with the cultivated plum compared with the harsh sloe of our hedges. The carrot and the hemlock are also mentioned among the exceptions; but, in the first place, it must be remembered that both are situated near the boundaries of a very large order, and that they both differ materially in their organic structure. Conium and analogous plants contain a sap which is absent in the non-poisonous Umbelliferæ. J. Chatin asserts that the active substance is not distributed in the fruits of hemlock in the same manner as in the other Umbelliferæ.

If plants are viewed from the standpoint of their chemical composition a deduction of the Linnæan principle is obvious, which, when their therapeutic properties were studied, seemed inexplicable. There are analogies of the characters and compositions which exist between allied families. DeCandolle says in regard to them: "We may even assume that the properties of certain families resembling each other in their organic structure are similar otherwise."

To make this part of the question explicit a truly natural botanic classification would be required, *i. e.*, one that would indicate the origin of the various Species, Genera and Orders, as well as the many ties which connect them, and also the process of development they went through. Such a classification could not be demonstrated by a table, but instead a geographical chart, as it were, would have to be imagined, with the Species, Genera and Families arranged in such a manner that the connecting species are bounded by the neighboring families. In the present condition of science this is impossible; nevertheless, the relation of organization existing between certain families may be taken into consideration. Let us see, in a few examples, whether the active principles attempt to intermingle to the same extent as the physical characters of two allied families do.

We will begin with the important group of *Rutaceæ*. Botanically, this family is placed among the *Burseraceæ*, *Ochnaceæ*, *Ranunculaceæ* and *Geraniaceæ*. Its relation to the *Burseraceæ* is established by the analogy between *Ailanthus* and *Rhus*. As we approach from this point we find that to the resinous constituents of the *Burseraceæ* an acrid volatile substance is added (*Rhus toxicodendron*); the bitter principle of the *Rutaceæ* disappears and is replaced by acrid, volatile principles (*Ailanthus glandulosa*). *Quassia* and *Picræna*, neighbors of *Ochnaceæ*, contain, like these, bitter substances. According to Baillon, the *Ran-*

unculaceæ are connected with Rutaceæ through the genus *Crossosoma*, which possesses the bitterness of *Quassia*; lastly, the *Zygophyllaceæ*, with aromatic, astringent leaves, are closely allied to the *Geraniaceæ*.

The *Berberidaceæ*, similarly examined, should be placed between the *Menispermaceæ*, *Papaveraceæ* and *Ranunculaceæ*. The botanic relation between *Menispermaceæ* and *Berberidaceæ* is very close, and in both the same active principle, berberina, predominates. The tie connecting the *Berberidaceæ* with the *Papaveraceæ* is, for the former, *Podophyllum* and *Jeffersonia*, and for the latter *Sanguinaria*; these genera nourish, too, on their colored, acrid and emetic sap. The *Ranunculaceæ* are connected with the *Berberidaceæ* by containing Berberin in common.

The *Cruciferaæ*, *Capparidaceæ* and *Resedaceæ*, botanically allied, contain in various quantities the same active substances (acrid sulphuretted oils). The *Polygalaceæ*, *Caryophyllaceæ* and *Violaceæ* are related by their characters as well as by the saponin and analogous substances (polygallic acid, violin).

We may mention yet that the *Lequimosæ* and *Rosaceæ* are rich in gum and tannin; the *Juglandaceæ*, *Balsaminaceæ* and *Myricaceæ*, in aromatic oleo-resins; the *Myristicaceæ*, *Monimiaceæ* and *Lauraceæ*, all rich in aromatic oils.

Sometimes the botanical similarity is not prominent enough to support that of the chemical constitution. For instance, the *Ranunculaceæ* and *Alismaceæ* contain an acrid, volatile body, which is dissipated by drying, but whose chemical nature is scarcely known. Though both families are placed far apart in our systems, they show certain analogies which have been recognized by Andanson and A. L. Jussieu already. Baillon says in reference to this, "Certain *Alismaceæ* are only to be distinguished from certain water ranunculi by the number of cotyledons contained in their embryo."

Finally, there exists, according to Claus, a similarity in the structure and composition between the lower plants and the inferior animals. Cellulose is found in the cloak of the lower molluscs (*Ascidia*); Chlorophyll in several animals (*Stentor*, *Hydra*, *Bonellia*). Cholesterin and other characteristic constituents of the nerve-substance have been found in the organs of *Leguminosæ*. This at first glance appears strange, but it must not be forgotten that the respective organs perform a function similar to the animal organs.

These few examples, which could readily be multiplied, seem to confirm satisfactorily the natural law, the examination of which has been attempted in the foregoing. In every instance where the facts are established, and where the organic structure is known, invisible gradations become evident by which nature succeeds in the gradual differentiation of living beings, and which make our classifications appear incomplete.

Conclusions.—1. Botanic species and families which are similar in their characters are also similar in the nature and properties of their constituents.

2. The species which form the connecting link between similar groups contain constituents belonging to the allied families.

3. The botanic and natural classification of the medicaments of vegetable origin is the only scientific and rational one.

THE SUNDEWS AND THEIR USES.

BY PIERRE VIGIER.

Abstract from a paper published in "*Bull. génér. de Thérap.*," July 15, 1878.

The first author who has written on and figured the round-leaved and intermediate sundew during the sixteenth century is Dodonæus, of Belgium, who considered them too drying, acrid and hot to be of any service in consumption, in which disease the plants were then employed. Tabernæmontanus (1588) states that these sundews have an acrid and burning taste, and are hot and drying in the fourth degree. Heermann (1715) used the sundew in phthisis, and claims that it diminishes asthma, relieves hoarseness and imparts strength. Siegesbeck (1716) found the taste of the leaves to be acid, and of the flowers and fruits to be bitter; that the juice coagulates warm milk, and that the plant produces in sheep which eat it a serious cough. He prescribed the decoction of the fresh herb in catarrhal bronchitis, and employed a tincture with success in influenza (*grippe*) and in epidemic pertussis in 1712. Linnæus stated that the acrid juice of the droseras is useful against warts, and Haller asserted that the sundew produces excoriations of the skin. Hahnemann and other homœopathic practitioners confirmed its efficacy in phthisis and severe coughs. Vicat, in his treatise on the poisonous plants of Switzerland, regards the sundews as corrosive, as ulcerating the skin, and as hurtful for the teeth; notwith-

standing this, they were employed against coughs, asthma and ulceration of the lungs.

The Pharmacopœia of Wirtemberg contained a compound *syrup of sundew* and an *elixir pectorale Wedelii*, having sundew as one of the ingredients.

In the second half of the eighteenth century, the sundew fell into discredit, and in the beginning of the present century it was rarely asked for, and few pharmacists kept a preparation of sundew.

In 1860 Dr. Eugene Curie experimented with the *drosera* upon animals, and reported his observations to the Paris Academy of Science, September 2, 1861; he had administered the plant in pulmonary consumption in the form of tincture and of alcoholic extract. In 1863, the author obtained from an herbalist, in the Vosges, several hundred kilograms of *Drosera rotundifolia*, at the rate of 10 francs per kilo, the fresh plant being received twice a week in a state of perfect preservation. It was immediately bruised, mixed with its own weight of alcohol, and after maceration for a month, expressed, and the tincture filtered. This had an alcoholic strength of 56 volumetric per cent., could be indefinitely preserved, was of a dark-brown color and a peculiar odor, and contained all the medicinal principles of the plant. On one occasion an assistant, while expressing the tincture, had kept his hands in it for some time and found the skin as if it had been burned.

On distilling off the alcohol, an extract of slight consistence, but easy of administration and therapeutically active, was obtained. Pills were made, consisting of 5 grams of this extract, and a sufficient quantity of liquorice root, the mass being divided into 100 pills.

Several years afterwards the author had sundew collected in the forest of Saint Léger and received *Drosera longifolia* in masses agglutinated by the juice of the glands and mixed with damp earth and mosses. This lot was only used for preparing the extract, which had the same properties as that of the preceding species.

The author has since succeeded in having the sundew collected at 5 francs per kilo, and since it takes 7 kilos of the fresh plant to produce 1 kilo of the dry, it follows that a kilo of the latter costs 35 francs, and could not be furnished in commerce for less than 40 or 50 francs. The author has not yet succeeded in cultivating the two species of *drosera*.

The dried plant, treated with 60 per cent. alcohol, yields one-fourth

of its weight of extract. 1 kilo of the fresh plant gives, with 1 kilo of strong alcohol, 1,500 grams of tincture, which, therefore, contained in 1,000 the extractive matter of 666 grams of the drosera. 1 kilo of this tincture yields 25 grams of extract; 1 kilo of the fresh plant furnishes 143 grams of dried product, and 100 grams of the latter yields 25 grams of extract, the same as 1 kilo of the tincture. The dried plant, treated with ten times its weight of 60 per cent. alcohol, yields a tincture identical with the above, obtained from the fresh plant.¹



DORSELA ROTUNDIFOLIA, Lin.



DORSELA LONGIFOLIA, Lin.

The author reports also on the physiological and therapeutical properties of drosera, mainly from the observations made by Mr. Curie. Although favorable results were observed in phthisis by the persistent use of this remedy, it failed in most cases, and appears to be best adapted in such which present symptoms of bronchitis. The best results were

¹ Tinctures made from fresh plants are called *alcoolatures* in France. According to the French Codex they are prepared from the bruised plants by maceration for ten days with an equal weight of 90 per cent. alcohol.—EDITOR.

obtained with daily doses of 10 to 15 grams of the tincture, but much larger quantities may be administered without inconvenience.

NOTE BY THE EDITOR.—Both species of *drosera*, which are represented above in their natural size, are indigenous alike to North America and Europe. We append a botanical description which is copied from "Gray's Manual."

DROSERA, *Lin.*, Sundew.—Stamens 5; stiles 3, or sometimes 5, deeply two-parted, so that they are taken for 6 or 10; slender, stigmatose above on the inner face; pod 3- (rarely 5-) valved, the valves bearing the numerous seeds on their middle for the whole length. Low perennials or biennials; the leaves clothed with reddish gland-bearing bristles, in our species all in a tuft at the base; the naked scape bearing the flowers in a one-sided raceme-like inflorescence, which nods at the undeveloped apex, so that the fresh blown flower (which opens only in sunshine) is always highest. (The glands of the leaves exude drops of a clear glutinous fluid, glittering like dew-drops, whence the name, from *δροσερός*, dewy.)

1. *D. ROTUNDIFOLIA*, *L.* (Round-leaved Sundew.) Leaves orbicular, abruptly narrowed into the spreading hairy petioles; seeds spindle-shaped, the coat loose and chaff-like; flowers white, the parts sometimes in sixes.—Peatbogs, common, especially northward. July, Aug.

2. *D. LONGIFOLIA*, *L.*—Leaves spatulate-oblong, tapering into the long, rather erect, naked petioles; seeds oblong, with a rough, close coat; flowers white (*D. intermedia*, *Hayne*).—Bogs, less common. June—Aug. Plant raised on its prolonged caudex when growing in water.

PLANTS USED by the INDIANS of the UNITED STATES.

BY DR. EDWARD PALMER.¹

The first paper upon this subject by the writer was published in the Report of the Department of Agriculture for 1870. The present paper will embrace all the additional matter that has since come under his observation.

FRUITS AND NUTS.—*Juniperus pachyphlæa*, *Torr.*, one of the finest ornamental Junipers, its wood being excellent for cabinet work; height about forty feet, and diameter from two to three feet. Abundant in Arizona. Its fruit, a staple article of food among the Indians, is sweet, having but little of the juniper taste. As soon as ripe the Indians commence to eat the nuts raw, and to lay up great quantities for winter use. They are then ground fine and made into bread.

¹ The writer wishes to acknowledge his obligations to Prof. Asa Gray; Mr. Sereno Watson, of Cambridge, Mass.; Dr. C. C. Parry, Davenport, Iowa, and Dr. George Vasey, Department of Agriculture, for kindly determining the species.

J. Californica, a dwarf but showy overgreen. Southern Californian Indians consume immense quantities of the fruit which is sweet and is eaten as soon as ripe. When the fruit is dry it is either ground fine and made into bread, or boiled in water to the consistency of mush. It must be nutritious, as the Indians get fat on it.

J. Californica var. *Utahensis* attains a height of twenty or twenty-five feet in Utah, and a diameter of twelve inches. The Utes eat the fruit raw or made into bread. As in the former species, the taste is quite sweet. These Indians use what they call Noo-ahn-tup, or what appeared to be excrements of insects left in hollows of the junipers, said to be ground and used for mush by the Pah-Ute Indians. The fibrous bark of this tree is made into saddles, breech clouts, skirts and mats to sleep on. The bark is rather brittle and not so good for domestic purposes as that of *Cowania mexicana*.

J. occidentalis.—The berries of this tree are gathered and consumed for food, but have more of a juniper taste than the former species.

Pinus torreyana, a very rare pine, on hills of Solidad, Southern California, only. The nuts are large and wholesome. Only the Indians near by gather them, as they are not in great abundance.

P. monophylla.—The common pine on the border of Lower California. It is a very productive tree. Its seeds, though rich, and good when fresh, are more digestible after being roasted, besides in that condition they will keep fresh a long time. Heat dissipates the oil property of the kernel and renders the hull brittle and easily removed. It is astonishing how many of these nuts an Indian can eat. From morning until night, as long as they last, cracking and eating go on. The Indians get very fat during a good pine nut harvest. They remove the hulls by putting a number of the nuts on a metate, and by rolling a flat pestle backward and forward until the hulls are loosened. The mass is then put into a flat basket tray and the hulls are blown off. The kernels are now ready to be eaten, or ground on the metate to flour, which if made into bread or mush is a palatable and nutritious dish. The interior of the young cone is also eaten.

As soon as the pine cones begin to open the Indians assemble for their great feast and camp among the pine trees during the nut harvest. The fruit upon the ground is gathered up by the children, while the females pluck from the trees the unopened fruit, which they place in a net. Draw-strings are tied around the neck of the net which, when full, is let down by means of a long rope fastened to the centre of the draw-strings. Some one on the ground empties the load, and the net is drawn up to be refilled. Thus for many days this gathering goes on until the supply is exhausted, or they have satisfied their wants. To hasten the opening of the cones, they are thrown on hot ashes for a few minutes. The seeds are at once removed and put into an earthen pot over a slow fire. After a few stirrings they are sufficiently parched to render the hull brittle, so as to be easily removed, while the oil in the kernel is set free. By this process the kernel is rendered more digestible and will keep for a long time. If not parched, the seeds would soon become rancid and mouldy.

Algarobia glandulosa or *Prosopis juliflora*, in Texas, Arizona, New Mexico and Sonora, grows from twenty to forty feet high, and eighteen inches in diameter.

Charcoal is manufactured from it, and it is also made into handsome furniture, the grain being very fine. It flourishes where no other fruit tree would grow, and is one of the most useful trees of the deserts. It yields a gum nearly identical with gum arabic for medicinal and technical purposes, especially in the preparation of mucilage, gum drops, jujube paste, etc. In parts of Texas great quantities are gathered for exportation. The Indians have long been acquainted with its valuable properties, for they not only eat it but mix it with mud and cover their heads with it for two or three days. When washed off, the hair of the oldest is not only jet black, but the unwelcome visitors that previously lodged therein are all dead. The leaves of this plant are used by the Indians of Southern California to give the blue color to their freshly tattooed faces, the spines of a species of cactus being used to puncture the skin. The moistened leaves are then rubbed over the markings and the desired color is obtained.

The fruit of this plant is one of the leading articles of diet with the Utah, New Mexico, California and Arizona Indians. It is gathered and housed with great care. Last winter I watched the process of converting the seed-pods of this plant into bread. A female squatted herself on the ground by a wooden mortar, the lower end of which was some distance in the ground. With a long stone pestle she pounded the hard seed-pods into meal. She then took from her head a small conical hat, and sprinkled a little water on the inside, and then a little meal alternately, until the hat or bread-tray was filled. After being patted on the top, it was set on the ground and exposed to the direct rays of the sun for some hours, or until it would turn out a solid cake or bread. So little water had been used to wet the meal that it seemed to me that it would not stick together, but possessing a large percentage of sugar, little water was necessary. This was rather chaffy-looking bread, not unlike that made of corn meal with all the bran in it; nevertheless, it was very sweet. The Indians keep fat as long as this bread lasts.

Quercus Emoryi, a rather common tree in Arizona, but the wood is of no use except for fuel. This tree as well as other varieties in the same region, however, yields abundance of food.

In the Smithsonian collection at the Centennial Exhibition was a sample of sugar from the mountain oak, at McCloud river, sent by L. Stone. The sugar or manna-like substance was in small irregular lumps of a dull color, and very brittle.

Q. undulata var. *pungens*.—This is a dwarf, compact bush, and very prolific. Its fruit is as sweet and as pleasant as fresh chestnuts, and is considered a great delicacy by the Lower California Indians. So ripe are the nuts before they fall, that nearly every one germinates while still in the cup.

Q. chrysolepis, the finest of Southern California evergreen oaks, produces the largest acorn and cup, but, though much used as food, the nuts are not considered as good as some others.

Q. sonomensis; a common deciduous oak of the hills about Julian, Southern California, very productive, affording much choice Indian food.

Q. agrifolia; this beautiful evergreen oak is very abundant in Southern California. When deprived of its branches, it will sprout again as freely as a willow. Its fruit is considered by Indians superior to all other acorns. The failure of the acorn crop is a serious loss, and drives the Indians of Southern California to hunt up every

kind of substitute for them. In preparing a food from acorns, the first thing is to take off the hulls. This is done in a mortar by a few slight strokes. The hulls are then removed, and the kernels reduced to a very fine meal. As all acorns, with few exceptions, possess a bitter, astringent property, which renders them unfit for food until it is removed, the Indians accomplish this by laying a coarse flat basket or strainer on a pile of gravel with a drain underneath. Rather fine gravel is now scattered thickly over the bottom, and up the sides of the strainer, and the meal laid thickly over this gravel. Water is added, little by little, to set free the injurious matter. When the water ceases to have a yellowish tinge, the deleterious property has been separated. The meal is removed by the hand as much as possible, after which water is poured over the remainder, so as to get the meal together. It is then scooped up by the fingers, very little being wasted in the operation. The meal is cooked in two ways: First, by boiling it in water, as we do cornmeal mush. When cooked by this process, it is not unlike yellow cornmeal mush in appearance and taste. The second mode is to take the meal, as soon as it is washed, and make it into small balls which are wrapped in green corn leaves. These balls are then placed in hot ashes, some green leaves of corn are laid over them, and hot ashes placed on the top of sufficient thickness to bake the cakes. These are considered extra nice by Indians. Females not only gather and store the acorns, but perform all the work necessary to convert them into food.

Rhus aromatica var *triloba* (Squaw berry), so named because the Indian women gather large quantities of the berries which are used as food. They are of a red color, and excessively sour, but very much used while fresh, during the summer months. The berries when macerated make a very pleasant drink, and they are also dried for food. The young twigs of this plant are used in the manufacture of baskets. The wood exhales a peculiar odor, which is always recognizable about Indian camps, and never leaves articles made from it. It grows loosely in mountain ravines, and attains a height of five to eight feet.

In Utah, Arizona, Southern California and New Mexico the Indians depend solely upon this plant for material out of which to make their baskets. It is far more durable and tougher than the willow, which is not used by these Indians. The mode of preparation is as follows: The twigs are soaked in water to soften them, and to loosen the bark, which is scraped off by the females. The twigs are then split, by the use of the mouth and both hands. Their baskets are built up by a succession of small rolls of grass stems over which these twigs are firmly and closely bound. A bone awl is used to make the holes under the rims of grass for the split twigs. Baskets thus made are very durable, will hold water, and are often used to cook in, hot stones being dropped in from time to time until the food is done.

Cerasus ilicifolia.—Indians eat this fruit and save the seeds which they consume raw, or ground and cooked into mush. They are dried whole or split. This is a very common plant in California, and is very productive. Its fruit is of a yellow color, with a pink tinge, and has the shape of gage plums, but possesses little pulp. The seeds are large, affording much food.

C. demissa.—The wild cherry of Southern California, a dwarf bush, but very

productive. Its fruit is palatable, either fresh or dry, and in both conditions it is largely consumed by the Indians.

Sambucus glauca (White elderberry); *S. racemosa* (Red elderberry).—The fruit of both these species is eaten by Indians. In Southern California the red species is preferred, being more fleshy and juicy than the white.

Mesembryanthemum acinaciforme (called strawberry). Its fruit resembles the strawberry in taste. This is one of the common plants along the sea-cost of Southern California, growing on sand beaches. It is very productive, and is eaten not only by Indians, but by Mexicans and other Whites.

Lycium pallidum, with scarlet fruit; *L. Berlandieri*, Arizona, with fruit of a red color.

L. Andersoni.—Fruit bright red, or amber color; Central Arizona and South-eastern California. The berries of these *Lyciums* are eaten by Indians of Arizona and California; in fact, Whites relish them also. They are quite agreeable to the palate, being of a sweet, mucilaginous substance, and adapted to warm climates. The clear bright-colored berry has a very tempting look, and when dried, resembles in taste dried currants.

Brahea armata.—This fine palm, found at the bottom of the Big cañon of the Tantillas, Lower California, grows from fifty to sixty feet high, its long, graceful, pendant branches of fruit making it a beautiful object. The Cocopah Indians consume large quantities of this fruit while fresh, and dry it for winter use; they also eat the base of the young leaves.

Pritchardia filamentosa.—This tree, from forty to fifty feet in height, is not so beautiful as *Brahea armata*, but its fruit is better food, containing more pulp, being much larger and of a more agreeable taste. Cocopah Indians consume the fruit fresh and dry in great quantities; the leaves could be applied to many useful purposes. In the spring the base of the young leaves is eaten raw by the Indians. The seeds of both these species of plants are ground fine and eaten, and are not inferior to cocoa-nut.

Shepherdia argentea (Buffalo berry), grows by water courses in mountainous districts of Central Utah. The habits of the tree are similar to those of the elderberry. It grows from ten to fifteen feet high, bears abundantly, fruit red, small, roundish, sour, but has a pleasant taste.

Amelanchier alnifolia (Service berry).—The fruit of this bush is much esteemed by both Indians and whites.

Rhus integrifolia, produces abundance of red berries that are very acid. Indians of Southern California place them in water to form a cool acid drink.

Ribes Menziesii.—Fruit very thorny, but Indians scald them to make them eatable.

Simmondsia californica.—The nuts of this plant yield a very fine oil. Indians of Southern California use them as an article of food.

Arctostaphylos tomentosa, *Manzanita* of the Spanish.—The fruit is produced in clusters, and resembles a small apple. It is of an agreeable acid sweet, and is consumed largely by Indians and Mexicans, both in the ripe and dry state. Indians dry the berries in great quantities, and prepare a favorite drink from them. A quantity of the dried fruit is slightly pounded until the pulp is separated from the seeds and outer rinds, the flour or finely-pounded pulp is separated and mixed with water,

which is allowed to stand until fermentation takes place, when it becomes intoxicating. This fruit, flour or dust is also eaten dry. The seeds after being deprived of their covering are ground fine and made into mush. A favorite mode of using the dried fruit is to grind it up fine, and after mixing the flour with water, to form the mass into thin flat cakes, which are baked in hot ashes. This bread is sweet and not disagreeable to the taste, though it has a repulsive, clay-like appearance of a reddish-brown color. All the western Indians relish this fruit in whatever way it is prepared. The Pah-Ute Indians use the leaves as tobacco and for medicine.

Photinia arbutifolia.—A beautiful tree whose berries are eaten by Indians of California, being first parched and ground and then made into mush.

Vitis arizonica, *V. californica*.—Indians of California, Arizona and Southern Utah consume large quantities of both species of grapes in the ripe state. They dry them also for winter use. The seeds of the ripe fruit are saved and ground fine, and eaten in that condition; they sometimes also grind up the dried grapes and cook them. The Pah-Utes at St. Thomas, Nevada, had several sacks of dried grapes for sale last spring.

Comandra pallida.—This plant yields a small nut, which is eaten raw by the Pah-Utes and the white children of Utah. If eaten too freely it produces nausea.

ROOTS AND TUBERS.—*Apios tuberosa*, common throughout the Northern and Southern States. It is known under the name of *Saa-ga-ban* by the Micmacs, by whom the pear-shaped roots are used as an article of food. The tubers are about the size of cherries, resembling common potatoes in taste, shape and odor. The skin is of a rusty or blackish-brown color. They contain a large per cent. of starch, which resembles that of wheat, and are very wholesome.

Zamia integrifolia (coontie root).—From the tubers of this plant the Florida arrow-root is made. It is abundant in the Southern part of the State. The tubers are large, frequently a foot long and three inches in diameter, rough and dark on the outside, but white inside and yield a large percentage of starch. It possesses an acid, poisonous ingredient, which has to be washed out in the process of converting the root into starch. The Indians of the Everglades consume a great deal of starch as food, prepared by their rude processes, and also sell some, but it is inferior to that prepared by Americans with improved machinery.

Hesperocallis undulata (White lily).—The bulbs of this beautiful plant are used as food by the Indians of Arizona.

Sagittaria simplex.—The Mojave Indians of the Colorado river, Arizona, as soon as the water subsides in the spring, dig the bulbs of this plant, which resembles the crocus root. It is exceedingly farinaceous and palatable, whether raw or cooked with other substances.

Oniscus occidentalis?—The roots, which are about the size of carrots, are sweet and well flavored, but require a long preparation to fit them for use. A favorite food of the Pacific coast Indians.

Carum gairdneri.—The tuberous roots of this plant are much eaten by the Indians of the Pacific coast, either raw or boiled with other substances. When raw it has a nutty taste, but when cooked assumes a carrotty flavor. Its outer surface is grayish, but its interior is white and farinaceous.

Milla capitata var. *pauciflora*, commonly called by the Mexicans of Sonora and

Arizona, Corvena. It is rather a small bulb, resembling the crocus both externally and internally. Its taste is agreeable, sweet and mucilaginous, and it is considered very nutritious, even by Americans.

Amoreuxia schiedeana; *Himajins* of the Papajos; *Saya* of the Pimos. It furnishes to the Indians of Arizona just named an edible root. They eat it roasted or baked in hot ashes. It is quite palatable, with a slightly bitter tang.

Camassia esculenta.—Wild hyacinth, a very common plant in the upper Mississippi valley. Indians and whites eat this root and find it very nutritious, with an agreeable, mucilaginous taste.

Valeriana edulis.—The root of this plant is eaten raw or dried; it is also ground into flour and made into bread or mush by the Pah-Ute Indians.

Claytonia lanceolata.—The roots of this plant, though small, are prized by the Pah-Utes as food, having a pleasant, crisp and nutty taste.

Psoralea castorea, Watson, new species. This plant grows in exposed sandy localities between Beaver Dams, Arizona and St. Thomas, Nevada. The tuberous roots are large, very white and farinaceous. The Pah-Utes eat them raw or cooked in hot ashes, or ground up and made into bread or mush.

Psoralea mephitica, Watson, new species. The leaves of this plant yield a very disagreeable smell, but the tuberous roots, though small, are farinaceous and are consumed as food after being prepared as mentioned for *Psoralea castorea*. It is abundant on the low places between the hills south-east from St. George, Southern Utah, and the Pah-Utes resort there to collect its roots.

Roots of carrots, potatoes, beets, turnips and parsnips are eaten by Pah-Utes. These Indians have acquired the taste for the tubers of all these plants, and they consume them in great numbers, either raw or cooked, without being cleaned. They place them in the hot ashes and devour them when cooked, skins, dirt and all. When boiled, not only are the tubers eaten but the water in which they were boiled is drank.

SEEDS.—Corn, Native Indian; *Ah-weaph* of the Pah-Utes. This variety has been grown by the Indians since the recollection of the oldest person among them. Well preserved kernels and cobs are found in the mounds of Utah. This species of corn grows from two and a-half to three feet high, and is cultivated by the Indians on the river bottoms, maturing in sixty or seventy days. The ears come out of the stalk five or six inches from the ground. Corn is a staple article of food with these Indians. In 1873 a Pah-Ute Chief, Tutzegavet, brought some very fine corn of his own raising to the agricultural fair, held at St. George, Southern Utah, and the first premium for that product was awarded to him.

Helianthus petiolaris, *H. lenticularis*, native sunflowers, *Awak* of the Pah-Utes. The seeds of these plants form one of the staple articles of food for many Indians, and they gather them in great quantities. The agreeable oily nature of the seeds render them very palatable. When parched and ground they are highly prized and are eaten on hunting excursions. The meal or flour is also made into thin cakes and baked in hot ashes. These cakes are of a gray color, rather coarse looking, but palatable and very nutritious. Having eaten of the bread made from sunflowers I must say that it is as good as much of the corn bread eaten by whites.

Moakeack Sunflower.—A Pah-Ute chief obtained some seed of the large, cultivated

sunflower and planted them, raising a large crop. Now many of the Indians plant this sunflower, and it goes under the name of the Chief Mokeack.

The native sunflower of Utah yields an exudation from the stems of creamy white color, nearly tasteless, but of a gummy nature. It is eaten by the Indians and white children of Utah, or rather chewed in place of pine gum.

Portulaca oleracea.—The seeds of this plant after being reduced to flour are eaten in the form of mush. The plant when tender is cooked as greens by the Pah-Ute Indians.

Sporobolus cryptandrus, or Quaque of the Pah-Utes, a species of grass, the seeds of which are much used by the Indians as an article of food. After being parched they are ground and mixed with water or milk and made into mush or biscuit. The flavor is good, and food thus prepared is very nutritious. The leaves yield a short, fine fibre, adapted to the manufacture of paper. It is abundant about St. George, Southern Utah.

Sporobolus airoides, *Eragrostis Purshii*, *Panicum crusgalli*, and *Vilfa asperifolia* are very abundant grasses in Southern Utah, and their seeds are gathered in great quantities for food by the Indians, who first parch and then grind them to flour, which is eaten either dry or in the form of bread or mush. It is healthful, nutritious and more agreeable in flavor than buckwheat.

Atriplex californica.—This plant grows in ravines and has large, long roots, which are much used by Indians and Mexicans of California as a substitute for soap. After being pounded and mixed with water it is said to be especially good in cleaning woolen fabrics. The seeds of this plant are also gathered, parched, reduced to flour and made into mush or bread. At other times the seeds are ground without parching and used as if parched.

A. Porwellii, *A. lentiformis*, *A. expansa*, *A. confertifolia*, *A. Nuttallii*, *A. canescens*.—All these yield abundance of seeds, which are gathered by the Indians of Utah, Arizona and California. The seeds are ground into flour and made into bread or mush.

Sarcobatus vermiculatus, "Grease wood" of the plains.—It produces abundance of seeds, which are prepared for food in the same manner as those of *Atriplex*, and eaten by the Western Indians.

Audibertia polystachya, white sage of California, is a very common plant in many parts of the State. From its flowers the bees make the celebrated honey for which San Diego is famous. Indians gather the seeds and use them cooked with other substances to impart flavor, as we do parsley.

Halostachys occidentalis, called *Tub-bo-welts* by the Pah-Utes.—The seeds are ground fine and made into bread or mush. It is one of the regular articles of diet.

Amarantus leucocarpus, *A. Porwellii*, *Carnoot* of the Pah-Utes.—The seeds of both these species are highly prized as food products. They are regularly cultivated by the Pah-Utes, and are also found abundant in the wild state on river bottoms. The plants are very prolific in seeds, which are very nutritious and of an agreeable taste. Bread or mush made of the meal is very good and not to be despised.

Lepidium Fremontii, *L. intermedium*, *Sisymbrium sophia*, *S. canescens*.—The seeds of all these plants are ground up with other seeds to impart flavor, and cooked

into bread or gruel. Sometimes they are eaten separately or even in soups. Many of the Western Indians use these seed unmixed as food.

Salvia columbariæ; *Chia* of the Mexicans and Indians of Arizona and New Mexico.—The seeds are used by them as food and medicine. Steeped in water they form a very nutritive drink for the sick. In the form of mush they resemble flax in properties and taste. In Mazatlan, Mexico, a drink prepared from the seed is sold in the streets. The meal forms a fine poultice for wounds, etc.

Medicago sativa, the introduced plant, alfalfa. The Pah-Utes use the seeds ground up and cooked into mush or gruel. The Indians and white settlers gather the tender branches and cook them as greens.

MISCELLANEOUS.—*Scirpus validus* (Tule plant). The Indians of California make bread out of the pollen of this plant, and the root is eaten by many tribes either raw or made into bread. The leaves are woven into mats and are used to cover their huts.

Typha latifolia (cat-tail rush.) The Pah-Utes eat the flowering ends, in the spring, raw or cooked. When boiled in water they are very tender, making good soup, which is considered a great delicacy.

Eriogonum inflatum.—The tender stems of this plant are rather acid. They are eaten raw by the Indians of Southern Utah.

Porphyra vulgaris, a sea weed commonly called Laver on our Eastern coast. It is found in nearly all parts of the world at low tide. Many of the Indians along the Pacific coast eat this plant cooked as greens or with meat. It is much relished by Chinamen, and is quite an article of commerce. The Chinamen residing along the coast, at low tides, gather this plant, which is easily taken from the rocks. It is then placed in round masses to dry, after which they are baled and sent to China. It sells from five to eight cents per pound in San Francisco at wholesale, to be shipped to China.

Caulanthus crassicaulis and *Stanleya pinnatifida* are eaten raw in the spring by the Pah-Ute Indians, the young plants being tender, and when cooked taste like cabbage. For this reason these plants are called cabbage by the settlers of Utah. The Indians gather the seeds, and after reducing them to flour make them into mush.

Cotyledon lanceolata, *C. pulverulenta*, *et.*—The tender leaves of these plants in spring are eaten raw by the Indians of Southern California; their soft, succulent nature causes them to be prized by some white people. As they grow in places not contiguous to water, the moist leaves are used to quench thirst.

Aphyllon californicum and *A. ludovicianum*, are parasitic plants that grow upon the roots of many species. All the plant except the bloom grows under ground, and consequently is nearly all very white and succulent. The Pah Utes consume great numbers of them in summer while on their hunting excursions after rabbits. Being succulent they answer for food and drink on these sandy plains, and, indeed, are often called "sand-food."

Hemizonia fasciculata, *Tar-weed*.—This plant in case of hunger is eaten by the Indians of Southern California after being cooked in the following manner: A quantity of the plants are boiled down until the liquid is of a thick tarry consistency, when it is ready for the stomach of the Indian. Its tar-like taste is objected to by

some. A youthful brave was very careful to inform me that young Indians never eat that stuff. If the procuring and cooking of the same depended upon the young Indians (males), they would go hungry a long time, for their laziness scarcely stimulates them to collect food; even if hungry they expect everything to be done by the older females.

Madaria elegans.—The seeds of this species of tar-weed are ground into flour, made into thin cakes, and baked in hot ashes by the California Indians. When cooked the bread has a gray but not very inviting look, yet the Indian eats it without complaint, though he prefers corn bread.

Arundo phragmitis, a species of cane growing along water courses and about springs in Southern Utah. Numerous small insects puncture the leaves of this plant and a liquid exudes. While in a soft state it is scraped off by the Indians with their long finger nails and eaten. At first it has a paste-like softness, but hardens like gum arabic, with a sugar candy density and color, having a rather sweet, gummy, liquorice taste. When the exudations are sufficiently hardened the cane is cut and laid in bundles on blankets, the manna-like food is then easily shaken off. This substance if mixed with water forms a pleasant, nutritious drink, highly prized by the Indians who call it Pah-gump-pea-abbah.

Honey.—Since the introduction of bees to the Pacific coast the Indians have acquired a taste for honey. The climate being mild the bees increase rapidly, and many swarms yearly escape to trees and rocks, thus giving the Indian a chance to obtain the honey. Some California Indians have domesticated the wild bees. In Southern California the Indians cut down the trees containing bees, put them in a sack, carry away the honey to eat, and sell the bees for one dollar a swarm, the purchaser taking all risks of getting a queen. Bees in a sack, for sale by an Indian, are surely a novel article of trade.—*The American Naturalist*, September.

(To be concluded.)

VARIETIES.

The Use of Thymol.—Thymic acid and thymol can now be had of our leading druggists. It is recommended for use with "Lister's Antiseptic Dressing," in proportion of 1 part to 20 of glycerin and 100 of water. This solution does not affect the instruments nor benumb the hands of the operator. As a local application it is especially useful, proving not offensive by its odor, like carbolic acid, while at the same time it is more effective, and can be used in smaller quantities. The following formulæ have been suggested:

Glycerole of Thymol.—Thymol, 1 part; glycerole of starch, 100 parts.

Thymol Lotion.—Thymol, 1 part; alcohol, 4 parts.

Ointment of Thymol.—Thymol, 1-4 parts; lard, 100 parts.—*Med. and Surg. Rep.*, August 17.

Large Consumption of Opium.—In the Maryland "Medical Journal," June, 1878, Dr. Chisholm related a case of a man who had taken ʒii of morphia at once, without any bad effect. A child of eight months regularly took ʒʒii of Magendie's solution in the twenty-four hours. These facts illustrate the remarkable tolerance produced by habit.—*Ibid.*

Quinoidin as a Febrifuge—The "Lancet" says: At a late meeting of the Académie de Médecine de Paris, M. Burdel, of Vierzon, read a paper on the Febrifuge Action of Quinoidin in the Treatment of Telluric Fevers. M. Burdel remarked that this resin-alkaloid possesses distinct febrifugal properties, and that it is closely analogous in its action to quinia. He finds that, like quinia, it may be freely administered, and with good results, in telluric and benignant intermittent fevers. But it is in quartan fevers and in telluric cachexia that it exerts a specially well-marked action; in these it is even superior to quinia. Like all analogous febrifuge remedies, quinoidin should be given for four or five weeks consecutively, in successive but properly timed doses. Its relatively low price is a great point in its favor. It cannot, M. Burdel thinks, supplant quinia in the treatment of intermittent fevers of an acute type, but it may even in these be a useful auxiliary; while in chronic cases he believes that it is actually superior to quinia.—*Med. and Surg. Rep.*, October 12.

Collection of Caoutchouc on the Banks of the Amazon.—Robert Cross, who went to Para for the purpose of studying the manner of collection and treatment of the milk juice of *Hevea elastica*, the tree which yields the Para caoutchouc, states that this tree grows in low moist regions; hundreds of caoutchouc-collectors were seen by him on the shores of the Rio Guama, who gather it in the following manner: Starting at daybreak, the native makes a deep longitudinal incision with his ax into the bark of a tree at a height of 2 meters and fastens a clay cup to the bark with a little clay directly under it; 10—12 cm. from this incision, at the same height from the ground, he makes another, and so on until the tree is encircled by incisions; he then proceeds to the next tree. The next morning he makes another circle of incisions into the first tree about 15—20 cm. lower than the first, and continues to do so, until he reaches the ground, when he again commences to cut circles between each two previous ones, commencing at the top. After all trees have been thus treated the collector empties all the cups into a large vessel and carries this to a shed near the river, where the juice is prepared for market, by pouring 2 or 3 cupfuls at a time on an oar-shaped mould, suspended from the ceiling over a constant heat of about 42°C., produced by conducting the heat from a wood fire with atmospheric air through a bottomless earthenware jar, filled with wood and palm-nuts. The mould has a thin clay coating to prevent the juice from adhering, and is kept in constant motion. The milky juice soon turns yellow; when sufficiently dry a new lot is poured on it, and so on until the mass is about 10 to 12 cm. thick, when the mould is withdrawn, the caoutchouc dried in the open air for several days, and is then ready for the market.

On the upper Amazon and in the province Ceara the manner of collection differs slightly; there the native cleans the outer bark carefully, and having surrounded the tree with a clay spout makes a large number of incisions above this, allowing the juice to run down over the bark into the spout, which accounts for the impurities always found in that caoutchouc, known as Saramby.

Cross thinks that a by far preferable method of preparing the juice would be to expel the water by heating the juice in shallow dishes over a water-bath, and also that many regions of the Malayan Peninsula, of British Birma, Ceylon and Coromandel would be suitable for cultivating *Hevea elastica*.—L. V. C.—*Pharm. Zeitschr. f. Russl.*, July 1, 1878, p. 407, from *Oest. Handelsjourn.*

Guaiaicum as a Test for Copper. By E. Purgotti.—Schönbein had noticed that copper salts in presence of cyanides gave a blue color with guaiaicum, and the author has since found that ferrocyanides, nitroprussides, sulphocyanates and cyanates, and also alkaline chlorides and chlorides of the alkaline earths produce the same effect as cyanides. On this reaction he has found a test for copper. The solution which must be free from all substances, such as ferric salts, etc., which color guaiaicum blue, is mixed with a solution of an alkaline chloride and poured gently down the side of a test-tube containing an alcoholic solution of guaiaicum; if the most minute trace of copper is present a blue color is produced at the junction of the two liquids, and if the quantity of copper be larger the whole of the liquid becomes blue on agitation; in this way .001 milligram of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ in a decigram of water gives a distinct coloration. The action appears to be due to oxidation by the cupric chloride $2\text{CuCl}_2 + \text{H}_2\text{O} = \text{Cu}_2\text{Cl}_2 + 2\text{HCl} + \text{O}$.—*Jour. Chem. Soc. [Lon.]*, September, 1878, from *Gazetta chimica italiana*, viii, 104—107.

Estimation of Calcium Tartrate in Crude Tartars. By A. Scheurer-Kestner.—The ordinary method of estimating calcium tartrate, by precipitating a solution of the crude tartar in hydrochloric acid with caustic soda, does not give correct results in presence of calcium sulphate, as the calcium sulphate and sodium tartrate undergo double decomposition, forming calcium tartrate and sodium sulphate.

To avoid this source of error, it is proposed to dissolve the tartar in hydrochloric acid, and to precipitate the whole of the tartaric acid, as calcium tartrate, by the addition of calcium chloride and caustic soda. The precipitate is washed, dried and calcined, and the resulting calcium carbonate estimated by titration in the usual way.

Another portion of the tartar is treated with hot water, and the solution is titrated with standard soda. From these data the amount of calcium tartrate and of potassium bitartrate in the crude material can be calculated.—*Ibid.*, August, 1878, from *Compt. rend.*, lxxxvi, 1024—1025.

Some Reactions with Lindo's Test for some of the Bases in Opium.
By How.—The following reactions are obtained by Lindo's reaction with sulphuric acid and ferric chloride ("Chem. News," xxxvii, 158, and this vol., p. 678):

Papaverina dissolves in sulphuric acid to a pale purple fluid, which becomes very pale and then brownish on standing about an hour. The addition of ferric chloride and warming cause the purple color to change quickly to yellow, while the liquid becomes turbid; the addition of water gives a colorless liquid, becoming pale yellow next day.

Narcotina dissolves to a bright yellow liquid, becoming orange on standing about an hour; then treated as above, a blood-red is produced, soon assuming a purplish tinge, then a bright red, resembling ferric thiocyanate, and remaining permanent at least for a fortnight.

Cotarnina gives first a clear, dark brownish-yellow solution; then, with ferric chloride, a whitish precipitate, dissolving to a dark red liquid, which with water assumes much of the color obtained with narcotina, but perhaps paler. It is equally permanent.

Narceina dissolves to an orange liquid, which becomes turbid and purplish, and finally of a pale red color.

Strychnia dissolves to a colorless liquid, and affords successively a clear yellow and a colorless liquid.

Brucia gives first a pale amethystine solution, then orange-yellow or red-yellow looking across the tube, and red on looking down it; on further solution an amethystine red, becoming pale, but still distinct, at the end of a fortnight.

Caffeina gives successively a colorless, a bright yellow, and a colorless fluid.

Piperina dissolves to a deep red, nearly black liquid, with a flocculent deposit on heating with ferric chloride; the addition of water gives a yellow liquid, the deposit appearing dark brown; the liquid was nearly colorless the next morning.

Betulin gives a dirty green-brown liquid, becoming clear and colorless with water.

Coumarin gives an orange-yellow clear liquid, which water renders very pale yellow.

Phloridzin (from bark of stem and roots of the apple tree) dissolves to a blood-red liquid, which is orange-colored at first, if very little of the substance is used; water gives a small flocculent precipitate, and leaves the solution of an orange color.

Quinia sulphate of commerce dissolves to a pale yellow liquid, which turns deeper yellow when warmed with ferric chloride, and colorless with water.

Cinchonia, impure, gives clear yellow, turbid yellow, and yellowish liquids.

Bebeerina sulphate, in brown scales, dissolves to a very dark liquid, becoming red with more sulphuric acid; with ferric chloride and warming, a dark green liquid—as seen over white paper—is produced, which gives with water a dirty yellow liquid—*Ibid.*, October, 1878, from *Chem. News*, xxxvii, 244.

Euphorbone. By O. Hesse.—Euphorbone was obtained from euphorbium by extracting with petroleum ether, and allowing the solution to evaporate spon-

taneously. On treating the semi-crystalline residue with hot alcohol, and, after the solution had cooled somewhat, pouring off from resin which was deposited, crystals separated which were purified by crystallization from acetone.

From his own analyses and those of Rose, Dragendorff, etc., the author deduces the formula, $C_{15}H_{21}O$, for euphorbone. This substance is isomeric with lactucone; or perhaps it may possess the double formula, $C_{30}H_{42}O_2$, and so be an isomeride of echicerin. Euphorbone melts at $113-114^{\circ}C$. For a chloroform solution the rotatory power of euphorbone is $(\alpha)_d = +18.8$ at 15° ; and for an ethereal solution $(\alpha)_d = +11.7^{\circ}$.—*Ibid.*, October, 1878, from *Liebig's Annalen*, cxcii, 193—195.

Tannin and Bitter Principle of Hops. By C. Etti.—The substance named “lupulo tannic acid” by the author does *not* precipitate gelatin; if, however, it is dried at $120-130^{\circ}$, it changes from yellowish-white to red, loses water, and when dissolved in very dilute alcohol, *precipitates gelatin completely* just like ordinary tannin.

On heating the yellowish alcoholic solution of the original tannin on the water-bath, it becomes red, and on evaporation a dark red residue remains, which also precipitates gelatin when again dissolved in dilute alcohol. The author calls this “phlobaphen.”

Analysis gives the same composition for this as for the red compound obtained by heating the lupulo-tannic acid at $120-130^{\circ}$, each having the formula $C_{50}H_{46}O_{25}$; and they may be supposed to result from the expulsion of a molecule of water from two molecules of tannic acid of the formula $C_{25}H_{24}O_{16}$.

The coarsely powdered hop flowers are placed in an extraction apparatus, and after being freed from resin and bitter principle as much as possible, the mass is extracted with 20 per cent alcohol. On evaporating to a small bulk and cooling, a red precipitate of phlobaphen is formed; this is dissolved in 90 per cent alcohol, evaporated to dryness and heated to $120-130^{\circ}$. If it tastes bitter, the bitter principle may be removed by ether. Phlobaphen is easily soluble in alkalis, and is precipitated unchanged by dilute mineral acids. On boiling the freshly precipitated and not previously heated phlobaphen with dilute mineral acids it is decomposed, glucose and one molecule of water being split off.

As the phlobaphen is easily prepared, is constant in composition, and precipitates gelatin solution completely, it may be estimated quantitatively like tannin, and may be used in standardizing the solution employed.

An ethereal extract of hop flowers contains, besides an essential oil, chlorophyll, a crystallized white and an amorphous brown resin, to which the bitter principle adheres. After driving off the ether, 90 per cent alcohol dissolves brown resin and the bitter principle, which may be separated from each other by adding water as long as the resin continues to be precipitated. Repeated solution in alcohol and dilution with water frees the resin from the bitter principle. The aqueous solution is evaporated in a vacuum over sulphuric acid, the amorphous residue dissolved in 90 per cent alcohol, again evaporated, and so on repeatedly, until well-formed extremely bitter, colorless crystals are obtained. The crystals are completely soluble in water. These experiments oppose the idea that the “bitter resin” of hops can be dissolved in water only with the aid of sugar, tannic acid, gum, ethereal oil, etc. The brown amorphous resin and the bitter principle of hops are two fundamentally different substances.—*Four. Chem. Soc.* [Lond.], Oct., 1878, from *Dingl. Polyt. J.*, cxxviii, 354—357.

MINUTES OF THE COLLEGE.

PHILADELPHIA, September 30th, 1878.

The semi-annual meeting of the Philadelphia College of Pharmacy was held this day at the Hall of the College, No. 145 North Tenth street, Dillwyn Parrish, President, in the chair; twenty-seven members present.

The minutes of the last meeting, in June, were read, and, on motion, approved.

The minutes of the Board of Trustees were also read by Wm. C. Bakes, Secretary of the Board, and, on motion, adopted.

By these minutes we are informed that in June last two gentlemen passed a satisfactory examination before the Professors and Examining Committee, and, having been by them recommended to the Board of Trustees for the degree, they were elected Graduates in Pharmacy. Their names are:

Aug. Dreher. *Thesis*—Examination of a case of arsenical poisoning.

Thos. E. B. Kernan. *Thesis*—Solution of oxychloride of iron.

Thomas S. Wiegand, on behalf of the committee appointed in March last, and continued in June, to take such action as might be necessary to effect an amendment to the Constitution of the College relative to the election of Trustees, and other matters, reported that they had effected the changes desired by the College by application to the court, and that the charter as amended will now read as follows:

Section 2. "The said College may establish by-laws and rules for its government and regulation, and for the preservation and application of the funds thereof, not repugnant to the Constitution and laws of the United States or of this Commonwealth; and shall have power to erect an edifice for their accommodation, and to constitute a faculty, or learned body, to consist of such head or heads and such a number of professors in pharmacy, materia medica, chemistry and the collateral sciences, as they may judge necessary and proper; and shall have power to confer degrees in pharmacy upon its graduates, and to do everything needful and necessary to the establishment of said College and Faculty."

Section 3. "The officers of said College shall be a President and two Vice Presidents, a Recording Secretary, a Corresponding Secretary and a Treasurer; and the respective duties of all of said officers shall be assigned by the by-laws. All of said officers shall be elected for the term of one year at the stated meeting of the College held in the month of March, and any vacancy that may occur may be supplied by a special election, to be held at the next stated meeting after the occurrence of said vacancy. There shall also be elected a Board of Trustees, consisting of eighteen members, in the following manner: Nine Trustees shall be elected at the stated meeting in September, 1878, three of them for the term of one year, three of them for the term of two years and three of them for the term of three years. At the stated meeting in March, 1879, nine Trustees shall be elected, in the same classification and for the same terms. At each subsequent stated meeting held in March and September of each year three Trustees shall be elected in the place of those whose terms will then expire, to serve for the term of three years.

"Vacancies in the Board of Trustees may be filled for the unexpired term at any regular election after any such vacancy shall occur. The President, the two Vice Presidents, the Recording Secretary, the Corresponding Secretary and the Treasurer shall also be members of the Board of Trustees so long as they shall continue in office. Thirteen members of the Board of Trustees shall constitute a quorum. The said Board of Trustees shall have power to conduct the ordinary affairs of the College, and make such by-laws, rules and regulations, and do all such other proper

acts as they may deem necessary for the government and support of the College and of the School of Pharmacy; and also to perform such duties as are or may be from time to time committed to them by the said College. The acts of the Board of Trustees are, however, to be subject to the revision of the College at each stated meeting."

On motion, the amended charter was accepted. The committee were then discharged, with the thanks of the College for the faithful manner in which they had accomplished the work assigned them.

The Treasurer reported the names of three members who are five years in arrears. In accordance with the usual custom their names were, on motion, directed to be stricken from the roll of members.

Professor Maisch called attention to the postponement of the meeting of the American Pharmaceutical Association at Atlanta, Georgia, to Tuesday, the 26th of November, at which time all the members of the Association are requested to attend, as the meeting, it is hoped, will be a large and interesting one.

This being the semi-annual meeting an election for nine members of the Board of Trustees, according to the amended charter, and a committee of three on Deceased Members, was ordered.

The President appointed Messrs. Mattison and Murray tellers, who reported the following gentlemen elected to the respective positions:

BOARD OF TRUSTEES.

For one year—Dr. Wilson H. Pile,

William C. Bakes,

Edward C. Jones.

For two years—William McIntyre,

Alonzo Robbins,

E. M. Boring.

For three years—Dr. Adolph W. Miller,

Albert P. Brown,

Richard V. Mattison.

COMMITTEE ON DECEASED MEMBERS.

Charles Bullock,

Joseph P. Remington.

Alfred B. Taylor,

Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 15th, 1878.

In the absence of the President, Mr. William B. Webb was called to the chair. The minutes of the last meeting were read and, on motion, approved.

The nomination for a Registrar was necessary, as it was the initial meeting of the series. Mr. Wiegand was nominated and elected.

The Chair requested the members to remind their friends of these meetings, as they would be thus rendered more interesting; and the Registrar requested the members to notify him of all changes of residence of members coming to their knowledge.

Mr. A. P. Brown, President of the Alumni Association, presented to the College library three volumes of "Goldsmith's Animated Nature," on behalf of Mr. Joseph Jacobs, a member of the present class. Accepted with thanks.

Professor Remington called attention to a novelty in compressed pills, which are covered with a layer of sugar. These have been introduced to the trade in a neighboring city under the name of "Vellentimels," and can be easily made by placing a small quantity of granulated sugar in the mould for compressing the pills, then the medicinal ingredients, and finally another portion of sugar, and following it with the piston of the machine, driven by a blow to solidify the mass; when completed the pill will be found sugar-coated. In the same manner powders may be compressed and coated with chocolate or with licorice.

Extract of licorice that had been badly worm-eaten was shown as a curiosity, and such it is, generally; but it is well known that the article known to older pharmacists as "refined licorice" was frequently seen in this condition.

A member present recommended as an excipient for pill masses a mixture of one part of tragacanth, seven parts slippery elm powder, moistened with either honey or syrup. The advantages claimed for pills made with it are solubility and small size (see page 515).

The propriety of making quinia pills with an excipient of sulphuric acid was queried by a member who found that the pills thus made were objected to because they became so hard; another objection has been made that when made up with acid they disagree with the stomach in very many cases.

Pills of chloride of calcium were mentioned as being very troublesome to prepare and very liable to deliquesce in consequence of the extreme solubility of the salt. Even if well made the only remedy, if it must be dispensed in pillular form, is to coat the pill with an ethereal solution of mastic or tolu. The fused chloride should never be used, as in dissolving it, it fixes two molecules of water, and in doing so gives out the latent heat of this water.

This subject gave rise to a discussion about the effects of salts while dissolving, some of which reduce the temperature of the liquid, while others produced an opposite effect.

Mr. Boring called attention to the infusion of colombo, it being a troublesome preparation to make each time it was ordered; he advocated the plan of making it as directed by the U. S. Pharmacopœia, and adding one quarter of a grain of salicylic acid to each fluidounce, to preserve it.

Mr. Webb inquired what was the custom of the trade respecting compound infusion of gentian, whether they generally prepared it when ordered or kept a concentrated preparation and diluted it at the time of dispensing. Mr. Webb stated that he had formerly made it of double the alcoholic strength of the Pharmacopœia, but observation had lately convinced him that a preparation of quadruple strength was preferable.

Professor Remington made an infusion of quadruple strength, and then diluted with a menstruum of $12\frac{1}{2}$ per cent. of alcohol.

There being no further business before the meeting, on motion, adjourned.

THOMAS S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—The twenty-sixth annual meeting will be held, as previously announced, in the city of Atlanta, on the twenty-sixth day of November. The reports from the various districts where the yellow fever has been epidemic during the past summer, show that this scourge is rapidly disappearing, and the cooler weather which has recently been prevailing throughout North America deprives a visit to the southern section thereof of all danger as to climatic disease. We repeat the statement made on a previous occasion, that Atlanta offers many inducements for a visit, not the least of which are the mountain scenery and the salubrity of its climate. Members from the Northern and Western States are particularly urged to use their best endeavors for being present on this occasion. The local secretary has informed us that the *traveling arrangements* will remain substantially the same as heretofore announced (see page 403), and that orders for tickets will be required from the permanent secretary. We are also advised that it is contemplated to get up a pleasant excursion to Florida. Further particulars will be given by the permanent secretary in the circular soon to be issued. Quite a number of goods intended for *exhibition* during the week of the meeting have already reached Atlanta, and all who desire to exhibit products of pharmaceutical interest are requested to communicate without further delay with the local secretary.

The chairman of the Committee on the *Centennial Fund* has informed us that contributions have been coming in very slowly, and he requests all members to actively aid in securing this fund for the Association.

The Colleges of Pharmacy.—We are pleased to learn that the Colleges of Pharmacy in the United States, as far as heard from, have opened their annual courses with larger numbers of students than they had heretofore. It speaks well for the young pharmacists that they seek instruction, which in the past generation would be obtained by few only, and that many seek it at the sacrifice of time and money. The benefit derived from these instructions cannot be otherwise but of lasting value to the students, and of increasing that *esprit de corps* which has become more manifest since the foundation of the American Pharmaceutical Association.

Vermont Pharmaceutical Association.—The ninth annual meeting was held at Hubbard's Hall, in Montpelier, October 22d. President Higgins called the meeting to order at 2.30 P.M. Resolutions of condolence were passed in regard to the demise of Luther L. Dutcher, an aged pharmacist of Vermont. At the close of the first session, the president read his annual address, in which he gave a historical sketch of the Association since its organization, and made several practical suggestions tending towards increasing the interest in the Association.

At the second session, held on the following morning, various committees were appointed. The following papers were read: on manufacturing pharmacists and their products, by W. J. Van Patten; on fashion in medicine, by A. O. Gates; and on *Vanilla planifolia*, by Geo. A. Crossman.

The committee on formulas was instructed to bring the results of their labors officially to the notice of the different medical societies of the State, and urge the recognition of such preparations as the standard for the State.

The following officers were elected for the ensuing year: A. O. Gates, of Morrisville, president; W. J. Van Patten, of Burlington, R. G. Morton, of West Randolph, vice-presidents; C. S. Boynton, of Braneon, secretary; E. C. Lewis, of Rutland, treasurer.

The next meeting will be held at Burlington, at the call of the executive committee.

The Philadelphia College of Pharmacy, we learn from a cable despatch, has been awarded a silver medal at the Paris exposition for the exhibit made of American drugs. The collection will be presented to a pharmaceutical institution in Paris.

The division of the students into two classes was not made any too soon. The number has increased again so that it would be impossible to accommodate them all at the same time in the spacious hall. Six lectures are delivered every week to the junior and the senior class.

Alumni Association, Philadelphia College of Pharmacy.—The First Social Meeting of this season was held in the College building, Thursday, October 3d, 1878, with an attendance of about fifty. In the absence of the president and both vice-presidents, Mr. R. V. Mattison was elected chairman.

The minutes of the last social meeting were read and approved.

Mr. Sayre being called on, spoke of the great importance to the students of the study of Botany and Materia Medica.

Dr. Murray read a lengthy paper on the "Metric System," strongly recommending its study and adoption, and explaining the simplicity and beauty of the system, by means of charts, measures, and on the black-board.

Mr. Mattison stated that it was reported that in France the metric system is little used. Dr. Murray thought it was only in the rural provinces that this was the case. It was mentioned that in New York and Boston the physicians, particularly the younger ones, are in the habit of writing their prescriptions in this system, and that some of the prominent druggists issue charts to the physicians explaining the relation between the metric and the customary weights and measures.

Mr. J. Jacobs presented for the College three volumes of Goldsmith's Animated Nature, printed in 1795.

Mr. Mattison read a paper on "Better Pharmaceutical Education," and one on "A New Excipient for Pills." (See page 515.)

Mr. Butts spoke of having used an excipient made from elm, which answered very well in most cases, but failed with dried sulphate of iron and with acetate of lead.

Mr. Sayre has used for ten years, with almost universal success, a mixture of tragacanth and glycerin, of which he keeps two strengths on hand; one containing 80 grains of tragacanth to glycerin \bar{z} i, and the other double the quantity of tragacanth.

Mr. Mitchell spoke of Scott's codliver oil emulsion being reputed to be made with mucilage of Irish moss, and inquired if any one had any experience in the matter.

Mr. Sayre suggested the subject of pancreatized codliver oil and pancreatic emulsion as a desirable subject for an essay by Mr. Mattison, who declined, having proved to his own satisfaction that pancreatic emulsion is financially and commercially a failure, but therapeutically a grand success.

On motion adjourned.

German Apothecaries' Society.—The seventh annual meeting was held at Coblenz, on Wednesday and Thursday, September 10 and 11, Director Wolfrum in the chair. Messrs. Korte, of Essen, and Westphal, of Düsseldorf, were appointed recording secretaries. The Pharmaceutical Society of Great Britain was represented by Mr. Thomas Greenish and Dr. Paul, and the Swiss Apothecaries' Association by M. Perrenoud, of Berne. The German Society has at present 2,779 members, belonging to 92 districts; but it does not yet embrace all the apothecaries of the German Empire.

Among the subjects which claimed the attention of the meeting, we mention the appointment of a permanent Committee on the Pharmacopœia; and the appointment of a committee to inquire into the instruction of pharmacists at the different universities, and into the necessity for having the large number of examination commissions as at present instituted. Various other questions relating to the condition of pharmacy in Germany received due attention.

Professor Fr. Mohr delivered an address on the development of chemistry from pharmacy, dwelling more particularly on the momentous results obtained by Scheele in the pharmaceutical laboratory, and tracing the growth of chemistry to a separate branch of science. The address concluded with a review of the various chemical theories and a consideration of the relations between the pharmacist and the manufacturer of chemical products.

M. Schlickum delivered an address on the instruction of apprentices.

M. Wolfrum intended to resign his official position, but was requested to serve for another year.

The next annual meeting will be held in the city of Hannover.

Swiss Apothecaries' Association.—The thirty-fourth annual meeting was held in Zurich, August 28 and 29; the president, Prof. Schaer, in the chair, Mr. B. Studer, Jr., secretary. The meeting was opened with the annual report of the president, in which the progress of pharmacy and the society affairs during the past year were reviewed.

The transactions of the society were mainly confined to the consideration of affairs relating to the practice of pharmacy in Switzerland. An address on the methods for determining the amount of moisture in air was delivered by Mr. Rosenmund.

The German Apothecaries' Society was represented by Dr. Brunnengraber. The following gentlemen were elected honorary members: Profs. Dragendorff, of Dorpat; Maisch, of Philadelphia, and Reichardt, of Jena.

The next annual meeting will be held at Geneva.

EDITORIAL DEPARTMENT.

The December number of this journal will be issued about a week later than usual, it being considered desirable that the present volume should contain an account of the Twenty-sixth Annual Meeting of the American Pharmaceutical Association, which will convene at Atlanta, Ga., on Tuesday, November 26th.

Official or Officinal.—The editorial remarks on page 449, appended to Dr. Murray's paper on this subject, have called forth the following answer:

The "remarks" not only give room for, but demand an answer. It is given with the desire to bring back to the normal line that which has been refracted, not to appear pugnacious. I hope the affirmative of the original subject has lost no force by its long convalescence. In order to properly connect what follows, it will be necessary to re-read the original article and answer, published in the September number of this journal.

Excusing the general severity of the "remarks," I come at once to an important correction. In the line, "*since* the publication of Dr. Miller's paper," the emphatic "*since*" loses its emphasis when we point to the fact that *official* is exclusively used in Prof. Attfeld's "Chemistry," issued in March, 1873; Mr. Squire's "Companion," issued in October, 1874; Dr. John Muter's "Chemistry," issued in March, 1874; and, since Mr. Wills follows Prof. Attfeld in his teaching, it is but reasonable to suppose that he had adopted the word not later than 1874, although I have nothing positive on this point earlier than the summer of 1877; while Dr. Miller's article was not published until April, 1875!

To show that words may be long known, yet not generally adopted, I mention that so high an authority as Worcester's "Unabridged Dictionary," 1878, gives *official* as relating solely to the shop and not the usual medical definition. The same cannot be said of Webster, but neither notices the term *unofficial*.

The "correctness" of the word is conceded by no less an American authority than Prof. Henry Hartshorne, who says, in his "Conspectus," page 460, issued May, 1874, "*Official* is the more correct term, though not so commonly employed."

Medicines are "*unofficial*" in the United States when not recognized by the compilers of the U. S. Pharmacopœia; "*unofficial*" in the British Empire when not recognized by the British Pharmacopœia, and so on.

In the second paragraph of "remarks" the citation of unfortunate terms in other connections is not thought particularly relevant. They too, however, may be corrected by confining the terms to their proper application.

Finally, preference should at all times and under all circumstances be given to correctness and definition, not to ambiguity, no matter how aged or how well understood.

NOTE.—This should have appeared last month, but for want of time it was not prepared until the journal was in press. Its position this month is owing to tardiness of the author.

F. MARION MURRAY, M.D.

Tenth month 19th, 1878.

We stand corrected as to the date of the authorities quoted in Dr. Murray's first paper. The additional authority quoted in the above reply sheds no new light on the subject, and it will be observed that Dr. Murray carefully avoids discussing the meaning of *official* as it has been sanctioned by usage, and does not notice the ambiguity of the same word if its application was extended as proposed. The mere citing of authorities is of no avail, and proves nothing except personal preferences. Those who still adhere to the word *officinal*, as it has always been used, we believe

far outnumber those who follow the innovation. That the word *unofficial* is not noticed in dictionaries, we suppose, is not regarded as a proof that such a word is not in use and has not a certain well-understood meaning.

The few ambiguous terms cited on page 450 were mentioned as examples, to show that ambiguity is much more common than is supposed by some; they were not cited as having any bearing on the question under discussion, as may be seen by anyone who will take the trouble of reading our remarks.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Druggist's General Receipt Book; comprising a copious Veterinary Formulary, numerous Recipes in Patent and Proprietary Medicines, Druggists' Nostrums, etc., Perfumery and Cosmetics, Beverages, Dietetic Articles and Condiments, Trade Chemicals, Scientific Processes, and an Appendix of Useful Tables. By Henry Beasley. Eighth edition. Philadelphia: Lindsay & Blakiston, 1878. 16mo, pp. 510. Price, \$2.50.

This book is well known to druggists from its previous editions. The present one is very convenient on account of its smaller size, and will be found to be as useful as its predecessors, containing, as it does, a large number of formulas, covering the ground indicated in the title.

A Guide to the Practical Examination of Urine. For the Use of Physicians and Students. By James Tyson, M.D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. Second edition. Revised and improved. With illustrations. Philadelphia: Lindsay & Blakiston, 1878. 12mo, pp. 172. Price, \$1.25.

To prepare a work on urinary analysis which should contain all the essential facts brought forth by analytical chemistry, and at the same time should be small and convenient to consult, is by no means an easy task, which, however, we are glad to say has been accomplished by the author. The familiarity of the author with the subject is evidenced throughout the work in the arrangement of the material, in the selection of the numerous tests for the various pathological products, and in the illustrations. We regard it as admirably adapted for a guide to the student in becoming acquainted with urinary analysis and with the precautions which are to be observed in testing, and for preparing him for the intelligent use of the various larger and more comprehensive works on the same subject, should he desire to extend his researches.

The typographical outfit of the work is likewise commendable.

The Physician's Visiting List for 1879. Twenty eighth year of its publication. Philadelphia: Lindsay & Blakiston.

This convenient and useful memorandum book for physicians has made its appearance. Its arrangement and size is the same as in former years, and will be found equally useful.

THE AMERICAN JOURNAL OF PHARMACY.

DECEMBER, 1878.

LABORATORY NOTES.

BY ALBERT B. PRESCOTT.

I. Scheme for the Valuation of Dover's Powder, with Analysis of Six Samples.

The samples were purchased in Ann Arbor, Massillon, O., and Dalton, O. The process was as follows: The powders were made alkaline and agitated with several portions of benzole. The emetia and narcotina are dissolved, the morphia is not dissolved (more than a *trace*), from alkaline solutions by benzole.¹ The benzole solution was concentrated, and the alkaloids extracted with acidulated (sulphuric acid) water; this solution was made slightly alkaline with ammonia, and agitated with several portions of petroleum naphtha (sp. gr. .725). Petroleum naphtha dissolves emetia and *only a trace* of narcotina.² The petroleum naphtha was concentrated, and treated with acidulated (sulphuric acid) water. The acidulated water solution was treated with Mayer's solution, 1 cc. of which precipitates 0.0189 gram emetia.³ The alkaline solution, after agitating with petroleum naphtha, was made slightly acid (sulphuric) and titrated with Mayer's solution, 1 cc. precipitating .0213 gram narcotina.⁴ The residue, after treating the powder with benzole, was treated several times with amylic alcohol, filtered and the filtrate evaporated to dryness and weighed as *crude* morphia. This was then redissolved in acidulated (sulphuric) water, filtered and the filtrate titrated with Mayer's solution, 1 cc. precipitating .020 grams morphia.

The method may be tabulated;

¹ Dragendorff's scheme, in Prescott's "Prox. Org. Anal.," p. 136.

² *Ibid.* Also Dragendorff: "Ermittelung von Giften," p. 300.

³ Dragendorff: "Werthbestimmung starkwirkender Drogen," p. 37.

⁴ Dragendorff: "Werthbestim.," etc., p. 87; "Proc. Am. Pharm. Ass.," x, p. 238.

The dry powder is moistened with ammonia and shaken with several portions benzole.

RESIDUE, containing *morphia*, indeterminate and inorganic matter, etc.

Agitate with several portions amyl alcohol; separate, evaporate the amyl alcoholic solution to dryness, and weigh as *crude morphia*. Dissolve in acidulated water, filter and titrate with Mayer's solution.

SOLUTION, containing *emetia*, *narcotina* and perhaps some indeterminate matter.

Concentrate, agitate with acidulated water; separate the water solution from the benzole by decantation or filtering through a wet filter (the benzole will remain in the filter), concentrate, make slightly alkaline (ammonia) and shake with several portions of petroleum naphtha.

ALKALINE SOLUTION.

Narcotina.

Make slightly acid and titrate with Mayer's solution.

PETROL. NAPH. SOLUTION.

Emetia.

Agitate with acidulated water; separate, and titrate its acidulated water solution with Mayer's solution.

In each case three grams were taken. They were all examined for adulterations and found to be pure. The following are the results of Mr. C. W. HEISTER's analysis :

No.	<i>Crude Morphia</i>	<i>Morphia</i> determined volumetrically	Per cent. <i>Morphia</i> (volumetric).	<i>Narcotina.</i>	Per cent. <i>Narcotina.</i>	<i>Emetia</i>	Per cent. <i>Emetia</i>
1	'0400	'0282	'94	'0107	'35	'0060	'20
2	'0535	'0303	1'00	'0129	'43	'0057	'19
3	'0300	'0242	'80	'0086	'28	'0095	'31
4	'0455	'0282	'94	'0143	'47	'0081	'27
5	0 535	'0262	'87	'0107	'35	'0076	'25
6	'0620	'0303	1'00	'0107	'35	'0085	'28
7	'0510	'0282	'94	'0096	'32	'0057	'19
Average pr. ct.			'92		'38		'24
U.S.P. standard			1'00				1

¹ This represents 2'4 per cent. *emetia* in the powdered *ipeacuanha* root.

For an assay of several specimens of Dover's Powders, by a different process, see "Am. Journ. Pharm.," Aug., 1876, p. 359.

II. An Analysis of Wahoo Bark and an Examination of Euonymin.

In 1862 Mr. Wm. E. Wenzell reported that the root-bark of *Euonymus atropurpureus* contains a glucoside (which he named euonymin) asparagin, several resins and a fixed oil, besides well-known non-medicinal substances. The so-called euonymin of the eclectic "concentrated remedies" is said to be made, like most of its class, by precipitating a strong tincture of the drug with water, and contains therefore all constituents of the bark which are soluble in alcohol and insoluble in water.

At my suggestion Mr. J. J. MILLER undertook a proximate analysis of wahoo root bark. Mr. Miller readily obtained *euonymin* by Wenzell's process ("Am. Jour. Pharm.," 1862, p. 387), and obtained additional reactions for it. It was found to be a white, intensely bitter, odorless, uncrystallizable solid, slightly soluble in water (Wenzell says it is insoluble), soluble in alcohol, in petroleum, slightly soluble in ether (hence wasted by the ether washing of Wenzell's process), insoluble in benzole (of coal tar) and in carbon disulphide. In dilute sulphuric acid it dissolves colorless; in the concentrated acid it turns first yellow then red-brown, these colors being intensified by adding a fragment of potassium dichromate. Both nitric and hydrochloric acids dissolve it with yellow color. From its alcoholic solution iodine solution with potassium iodide gives a brownish-red precipitate; potassium mercuric iodide, a white precipitate; sodium phosphomolybdate, a green-yellow precipitate; tannic acid, a slight white precipitate; picric acid, a precipitate only on long standing. The solution of euonymin in dilute sulphuric acid was precipitated green-yellow by sodium phosphomolybdate, the addition of ammonia changing the precipitate to a blue solution which faded on boiling.

The bark of the root was also subjected to a full proximate analysis, following Rochleder's plan in the main. By redistilling several times from sodium chloride solution, then extracting the distillate with benzole and evaporating this solution carefully, a small quantity of a *volatile oil* having the odor of the drug was obtained. This volatile oil was clear, brownish in color, of balsamic taste, neutral in reaction and evapo-

rated very slowly on simple exposure to the air. Mr. Clothier, in 1862, found no volatile oil, which may have been due to the solubility of the oil in water not saturated with sodium chloride. In farther operations, albumen, starch, gum, wax, resins, fixed oil and glucose were found. The details of the processes, here omitted, are given in a fuller report preserved at the university.

What medicinal properties, if any, belong to the volatile oil and the resins we are at present unable to declare. The euonymin of the list of "concentrated remedies" contains both resin and volatile oil. Its virtues, though due chiefly to the glucoside, may be modified by the resins and oil, and diminished by inert material.

III. A Partial Analysis of the *Oxytropis Lamberti*, the So-called Crazy Weed of Southern Colorado.

In the spring of 1876 a resident of Rosita, Col., sent some specimens of a weed which he called "crazy weed," and which he said was sometimes called milfoil or yarrow. He wrote that it was poisonous to horses and cattle; that he had lost a number of horses by their acquiring a taste for it. When horses have once tasted of it they will eat nothing else. The symptoms resemble founder and paralysis of the nervous system. The Mexicans of that country sometimes use it in making beer, and its effects upon men seem to be about the same as upon animals.

The examination of the plant was assigned to Miss CATHERINE M. WATSON. It was identified as *Oxytropis Lamberti*, nat. ord., Leguminosæ.

The fresh root is, externally, of a yellowish-brown color. It is very flexible and tough, and may easily be torn into long fibrous strings. The transverse section shows a thick, whitish bark surrounding a bright yellow woody column. The root has a peculiar and disagreeable odor, and a sweet taste resembling that of green peas. Under the microscope, from the outside toward the centre, the tissues appear as follows:

1. The epidermis, consisting of two rows of tabular weathered, brownish cells.
2. A broad zone of parenchyma, interrupted by wedges of liber fibre, which have their bases toward the axis of the root or against the bases of the

3. Wedges which make up the woody column of the root.

The elongated fibres are partly united into liber bundles and partly formed into a net-work, making a very loose and open structure. Occasionally masses of resin are found occupying three or four absorbed cells. The wood is traversed by numerous medullary rays, which have the same structure as those of the bark. The vessels are grouped together in bundles of from three to five, and branch and anastomose, forming a net-work like that of the liber. The cells of the wood parenchyma, as well as those of the bark, are thin-walled and nearly cubical in shape. Some needle-shaped crystals of calcic oxalate were found in the cells surrounding the liber. Solution of iodine imparts an orange hue to the whole root, proving the absence of starch.

The chemical examination was conducted as follows: The dried and ground root was digested in water, acidulated with sulphuric acid for twenty-four hours, strained through muslin and filtered. The filtrate was nearly neutralized with solution of baric hydrate, and evaporated on the water-bath to the consistency of a thick paste, then treated with hot alcohol and digested for several hours. The solution was decanted, the residue washed with absolute alcohol and the alcohol recovered from the solution by distillation. The residual water solution was diluted with acidulated water, and the acid solution was then washed with ether. The decanted ether gave only a slight residue. The solution was then made alkaline with ammonia and again washed with ether. This ethereal solution had a disagreeable odor, a yellow color and a deep blue fluorescence. Allowed to evaporate spontaneously, it left a brownish, waxy residue, which was only sparingly soluble in pure water, but was dissolved readily by water acidulated with sulphuric or oxalic acid. This solution gave precipitates with potassic mercuric iodide, metatungstic acid, phosphomolybdic acid and solution of iodine in iodide of potassium. The precipitate formed by tannic acid was re-dissolved in an excess of the acid. Strong sulphuric acid gave a bright red color, turned to brown by heating. Phosphomolybdic acid, followed by ammonia, gave a deep blue solution. The solution was found to contain nitrogen upon being tested by Wanklyn and Chapman's method. It was attempted to purify of all non-alkaloidal matter by precipitating the solution with phosphomolybdic acid, washing the precipitate with a small quantity of water, mixing with a quantity of baric carbonate, drying at 100°C., and extracting with boiling alcohol

(Husemann, "Pflanzenstoffe," p. 25). This alcoholic solution, upon evaporation, left a brownish, waxy and bitter residue, which was readily soluble in chloroform and ether. A small portion dissolved in water acidulated with oxalic acid quickly liberated iodine from iodic acid. A test for nitrogen and precipitates with the alkaloid reagents were obtained, as before purification.

Another portion of the root was treated with ether for the resin. The ether, after decantation, was allowed to evaporate spontaneously, and the residue treated with acidulated water. The water solution was bitter, and after standing two or three days deposited a purple-brown powder. The resin was soft, waxy, insoluble in alkalies, benzin, petroleum naphtha, turpentine, carbon disulphide and hydrochloric acid. It was soluble in ether, chloroform and alcohol, in sulphuric acid with a brown color, and in nitric acid with a bright yellow color.

At this point the work was interrupted by lack of material.¹

In the "Proceedings of the Academy of Natural Sciences," 1877, page 274, some mention is made of this plant; nothing, however, that has not already been mentioned above.

Some physiological experiments were made upon himself by Mr. W. R. BIRDSALL. He used the dried ground root. After taking twenty-grain doses at intervals during several days and experiencing no effect, four forty-grain doses were taken within an hour and a half. Five hours after taking the last dose slight colicky pains were experienced, and a slight smarting of the eyelids was noticed, but no other marked effects. An ounce and a half of fluid extract was given to a kitten two months old. No effect was observed except that it appeared to dislike the taste.

From these experiments it would seem that the dried ground root possesses no poisonous properties.

IV. An Analysis of the Cranberry (*Vaccinium macrocarpum*).

As immense quantities of these berries are often rendered useless by being frozen, the inquiry has arisen as to how these could be utilized. Mr. L. W. MOODY made an analysis of the berry, obtaining the following :

¹The work was resumed at a later period, but only a short time before Miss Watson's death.

Pectous substances, etc.,	6.27 per cent.
Seeds, skins, etc.,	9.64
Citric acid,	2.27
Sugar,	2.23
Water,	82.23

Sum of special determinations, 102.64

There was found 1.25 per cent. of ash included in the above, mostly in the seeds and skins. The determinations of the pectous substances can only be approximate. No tartaric, malic, oxalic or tannic acid was found to be present.

It was found that good *cranberry jelly* could be made from the berries with less than the usual amount of sugar, by first expressing and rejecting a portion of the juice, so that the jelly should consist more largely of the pectous substances of the fruit. Taking eleven ounces of berries, expressing from four to six ounces of juice, boiling the residue with water, straining through a cloth, concentrating, adding two and a half ounces of sugar, and concentrating till a pellicle formed, there were obtained four ounces of very fine jelly. From this it is apparent that the jelly might be obtained as a by-product in manufacturing citric acid from the berries. Also, as Mr. Moody verified by trial, the residue, after expressing the juice, can be fermented and distilled for alcohol.

From one hundred pounds of berries, two pounds of citric acid and about thirty-three pounds of jelly could be obtained. Or, instead of the jelly, about one pound of absolute alcohol, or its equivalent of weaker alcohol, might be had.

V. The Purity of Carbonate of Magnesium.

The requirements of our Pharmacopœia are pretty strict for carbonate of magnesium, ordaining the almost absolute exclusion of calcium salts, sulphates and sodium carbonate, as follows: "Wholly dissolved by sulphuric acid, forming a solution which does not precipitate with oxalate of ammonium (a delicate test for calcium). Distilled water, which has been boiled with it, does not change the color of turmeric (sodium carbonate) and yields no precipitate with chloride of barium (sulphates) or nitrate of silver (chlorides, etc.)" As generally manufactured, the three impurities named, calcium salts, sulphates and sodium carbonate, would be of natural occurrence, and their traces would not be "medicinal impurities" in the administration of carbon-

ate of magnesium itself. But in the use of this article as a material for certain preparations, even traces of some of the foreign substances named would become "pharmaceutical impurities." Essential waters made with carbonate of magnesium, containing sulphates and soluble carbonates, become contaminated with these salts, and the alkalinity, due to the presence of sodium carbonate, may prove a very serious incompatibility with salts of the potent alkaloids which are often put up in these solutions.

To furnish some evidence as to the purity of the carbonate of magnesium in use, its examination was assigned to Mr. R. H. WALLACE. The following are his results :

Carbonate of Magnesium.	No. 1.	No. 2.	No. 3.
Magnesium, as oxide, . . .	40.31 per cent.	38.56 per cent.	42.12 per cent.
CO ₂ , of carbonate, . . .	33.25	32.18	34.05
Water of hydration, . . .	22.67	22.30	21.58
Calcium, as oxide, . . .	1.61	2.15	1.25
Sodium, as oxide, . . .	. . .	2.50	. . .
Iron, as ferric oxide, . . .	0.21	0.34	traces
Sulphates, . . .	traces	traces	. . .
Chlorides, . . .	. . .	traces	. . .
Silica, . . .	. . .	traces	traces
Total, . . .	98.05	98.03	99.00

No. 1 was of Pattinson's manufacture, No. 2 of Jennings's, No. 3 from Germany. The carbonate of magnesia, as manufactured under different conditions, varies very considerably in the degree in which it is a basic carbonate. Deducting the carbonic anhydride of the calcium and sodium carbonates, we have, for No. 1, 94.98 per cent. of magnesium carbonate; for No. 2, 89.58 per cent.; and for No. 3, 96.77 per cent.

Two samples of calcined magnesia were examined, with the following results :

Calcined Magnesia.	No. 1.	No. 2.
Magnesium, as oxide, . . .	89.67 per cent.	96.21 per cent.
Water of hydration, . . .	5.85	. . .
Calcium, as oxide, . . .	1.89	1.19
Sodium, as oxide, . . .	1.23	.80
Iron, as ferric oxide, . . .	.27	.12
Silica, . . .	trace	trace
Chloride and carbonate, . . .	trace	. . .
Total, . . .	98.91	98.32

No. 1 was "Husband's Calcined," and No. 2 was "Powers & Weightman's Heavy Calcined."

University of Michigan,
School of Pharmacy, Nov. 5, 1878.

NOTE ON SODIUM SALICYLATE.

BY CHARLES W. DREW, PH.B.

The very extensive and increasing application of sodium salicylate in medical practice renders it desirable that some method which can be relied upon to produce a pure and uniform product, and which at the same time affords the greatest attainable simplicity of manipulation, should be generally known among pharmacists. With a view toward supplying this need, I would call attention to the results here embodied, which are derived from personal observation and experience in the manufacture of the salt.

Salicylic acid, $C_7H_6O_3$, is a bibasic acid, though the neutral salts of the monad metals have not as yet been prepared. The chief medicinal salt of salicylic acid is the acid sodium salicylate, $NaC_7H_5O_3$. This salt may be, and has been, prepared in several ways, most of which have been more or less unsatisfactory, either from the impurity or variability of the product, or from the complicated nature of the process itself.

The simplest methods for the preparation of the salt are by the treatment of salicylic acid with either the sodium monocarbonate or sodium dicarbonate. If the normal carbonate is employed the reaction which takes place is in accordance with the formula: $2(C_7H_6O_3) + Na_2CO_3.10aq. = 2(NaC_7H_5O_3) + CO_2 + H_2O + 10aq.$

From this reaction we deduce the fact that 1 part of salicylic acid, treated with 1.036 part of crystallized sodium monocarbonate, yields 1.15 parts of sodium salicylate.

If the acid sodium carbonate is employed, the reaction is expressed by the formula: $C_7H_6O_3 + NaHCO_3 = NaC_7H_5O_3 + CO_2 + H_2O.$

This similarly admits the deduction that 1 part of salicylic acid treated with .608 part of acid sodium carbonate yields 1.17 parts of sodium salicylate.

For extemporaneous dispensing of sodium salicylate in solution, the following formula will be found available:

R	Salicylic acid,	1250 grs.
	Sodium dicarbonate,	745 "
	Water q.s. for 6 fl. $\bar{5}$.	

Each minim of the resulting solution contains .5 grain of sodium salicylate.

The best method of making sodium salicylate for general dispensing

is as follows: Take of pure crystallized salicylic acid (that of German manufacture is the best in the market) 1 part. Take of pure crystallized and uneffloresced sodium monocarbonate (that obtained by the recrystallization of commercial sal soda is usually sufficiently pure) 1.04 part. Add to the acid in a glass or earthenware vessel sufficient water to form a paste, and gradually add the sodium carbonate. The salt is readily decomposed, the carbonic anhydride being evolved, and the sodium salicylate formed entering into solution in the water present. If the constituents were pure, filtration should be unnecessary, but if required filter through paper, or preferably, strain through fine muslin into a water-bath of block tin or porcelain. Heat until the dissolved carbonic anhydride is expelled, and then test the reaction of the solution either with test paper or with a few drops of test solution. In this connection it may be well to state that the removal of a few drops and the addition of the test liquid is preferable, as the action upon test paper is rather indistinct unless the solution be quite considerably diluted. If the solution is alkaline, add salicylic acid in slight excess; if any considerable excess of acid is present, render nearly neutral by addition of sodium carbonate. It is necessary to be quite careful in this, as any considerable excess of acid will render the salt, to a slight extent, insoluble in water, and the slightest excess of alkali will invariably render the salt of a shade varying from a light gray to a deep lead color. Evaporate to dryness upon the water-bath with constant stirring, avoiding more than a moderate heat, lest the salt be partially decomposed and some of the salicylic acid be sublimed.

The resulting salt will be of a very nearly pure white color, and exhibits no tendency to change upon exposure to the air. It is readily and completely soluble in nine-tenths of its weight of water at 60°F., and in about .65 of its weight at 180°F., the solution being of a light amber color.

Alcohol of 95 per cent. dissolves about one-tenth of its weight at 60°F., and at 120°F. about one-seventh of its weight of the salt, while glycerin at 180°F. dissolves 50 per cent. of its weight, the solution remaining perfect when cooled to 60°F.

This process differs somewhat from any heretofore recorded in the journal, and while all of them *may* yield satisfactory products, I consider that this has several manifest advantages over any of them.

Mr. John Williams (*"Am. Jour. Pharm.,"* 1876, p. 546) gives a

process in which sodium hydrate is used to saturate the salicylic acid. He gives it as his experience that "the sodium salicylate made from the artificial salicylic acid is liable to be more or less impure and indefinite in composition." It certainly will be unless great care is taken to employ pure salicylic acid, yet I consider that the best crystallized acid of the market is sufficiently free from impurities to insure a pure and uniform product. The principal arguments against the employment of sodium hydrate for the saturation are the high price of the pure article and the solubility of any accidental excess in alcohol if purification is attempted by recrystallization. The recrystallization from alcohol, owing to its ready solubility, is difficult, entailing a considerable loss of alcohol as well as time, and is usually regarded as rather an unsatisfactory process.

Mr. G. W. Kennedy ("Am. Jour of Pharm.," 1877, p. 592, saturates an indefinite quantity of a 20 per cent. solution of sodium hydrate with salicylic acid, by adding it *until it is no longer dissolved* (italics mine), filters and evaporates to dryness. The addition of the acid thus indefinitely would be liable to insure a greater excess of salicylic acid than was desirable, and thus impair the purity of the salt.

Mr. Pennypacker ("Am. Jour. of Pharm.," 1878, p. 114,) employs the acid sodium carbonate, adding it to the acid mixed with water, *as long as there is effervescence*, evaporates to dryness upon a water-bath, dissolves in alcohol, *pours off the clear liquid*, and evaporates the alcoholic solution to dryness.

The indefiniteness of the terminal reaction is apparent, and will, unless very carefully manipulated, result in an unsatisfactory product. The existence of any residue insoluble in alcohol indicates either the unsuitable character of the materials employed or else an avoidable excess of the sodium dicarbonate, in which case the salt would be to a greater or less extent colored. If, on the other hand, salicylic acid were present in excess, it would be readily dissolved by the alcohol and be mixed with the supposedly purified salicylate. The process also necessitates a loss of alcohol, or the labor necessary for its recovery.

The process which the author recommends has been employed practically for some time, and has been found to be the most economical and satisfactory of any which have been tried for the manufacture of the salt upon a large scale, and it will doubtless be equally satisfactory in the hands of careful pharmacists.

Brooklyn, N. Y., Nov. 18. 1878.

MEDICATED SOLUTIONS OF ALUMINA.

BY HENRY G. DEBRUNNER, F.C.S.

Read at the Pharmaceutical Meeting, November 19.

To the class of remedies that once had an almost general reputation, and now, in spite of their therapeutic value, are scarcely used, belongs the benzoinated solution of alumina, the preparation, dose and mode of application of which we find in the U. S. Dispensatory, page 1011, 13th edition.

Similar to Pagliari's styptic liquid, it surpasses the same in efficiency and purity in many respects, besides being, at the same time, by no means an expensive article (*vide* U. S. Dispensatory, page 174, 13th edition).

Instead of using an alum solution, as done by the before named Roman pharmacist, a solution of sulphate of alumina, $\text{Al}_2\text{O}_3, 3\text{SO}_3$, previously saturated with alumina hydrate so as to make its composition approach that expressed by the formula $(\text{Al}_2\text{O}_3)_2, 3\text{SO}_3$, is subjected to benzoination by being heated for several hours with a certain quantity of bruised benzoin. By this treatment a number of the constituents of benzoin are dissolved in the solution, among which benzoic acid, and a resinous, brownish body possessed of aromatic odor are the most important. By this mode of preparation the existence of free non-combined sulphuric acid, which might be found in Pagliari's original solution, is rendered impossible.

If properly prepared, the specific gravity of this compound is 1.26; it is perfectly clear and of sweet balsamic odor and taste. As to its medicinal qualities and value, I wish to refer to the authorities quoted in the U. S. Dispensatory, page 1011, 13th edition.

The styptic properties of this preparation are due to the immediate coagulation of blood or albuminous substances in general which it produces, assisted by the presence of benzoic acid. Unlike carbolic acid, which is possessed of a destructive action over the lower grades of organic life, whether vegetable or animal, it acts by mere coagulation, thus excluding the air, the vehicle of numerous spores. These considerations induced me to make experiments, with the view of obtaining a *carbolyzed* benzoinated solution of alumina, and of uniting the disinfecting power of carbolic acid with the antiseptic properties of the benzoinated solution. I found that 3 per cent. ($\frac{1}{2}$ f.oz. to pint) of

carbolic acid could easily be incorporated into the first-named preparation. From the fact that the carbolic acid is easier taken up by a basic alumina solution than by water, it may be possible that it exists in the same as carbolate of alumina, which, however, is to be proved by further experiments. Carbolyzed solution of alumina may be used in the same way and mode as the benzoinated preparation. It is a clear liquid of 1.25 to 1.27 sp. gr.; the odor of carbolic acid is but slight, it being overpowered by that of benzoin. If exposed to cold it becomes slightly turbid, but will clear again on elevation of temperature.

Chemical Laboratory, Black Diamond Steel Works, Pittsburgh, Nov. 15, 1878.

UNGUENTUM AQUÆ ROSÆ.

BY GEORGE W. KENNEDY, PH G.

During the past few years, quite a number of articles have appeared in the various pharmaceutical journals on the preparation of cold cream, recommending a change in the present formula. Some of the writers favored the addition of borax, the intent and purpose of which I believe is to whiten and improve the appearance of the ointment. The refrigerant properties of borax would make it an excellent addition, when applied to chapped hands or lips, and for all other purposes for which cold cream is generally used, were it not for the many things which are often prescribed with the ointment, such as calomel, I cannot see that there would be any serious objections or reasons of a persuasive character to prevent its entering as one of the constituents of cold cream; but it is chemically incompatible with the mild chloride of mercury, reducing it to mercurous oxide, and, instead of dispensing an elegant-looking ointment, a dirty lead-colored salve is furnished, quite different in appearance from what it is expected to be.

On account of the ointment as now prepared being liable to become rancid when kept for some time, and on account of the separation of the rose water, some propose glycerin as a substitute for the water, with an increase of either wax or spermaceti, or both. This I consider a decided improvement, although some objections are made to it, owing to the increased quantity of solid material which is not absorbed by the skin and produces an unpleasant sensation of stickiness.

Some authors favor the substitution of olive oil for the sweet oil of

almonds. I cannot see that the former has any advantage over the latter, but, on the contrary, I claim that the almond oil is far superior, therapeutically and pharmaceutically, on account of its containing more olein, although the difference is not much. Olive oil contains 72 per cent., while the oil of almonds contains 76 per cent. Olive oil is also more liable to oxidation, more disposed to rancidity, and does not make an ointment as handsome in appearance as almond oil.

I had occasion to make for a country practitioner considerable quantities of cold cream in the summer season, as well as in the winter, and owing to the high price of almond oil at that time he suggested that I use something cheaper, and proposed olive oil. I made some as requested, and of as fine a quality of olive oil as could be obtained, leaving the water of roses out and using attar of roses instead, with an increased quantity of olive oil. Before it was all used he made complaint that it was quite rancid, and of a very disagreeable odor, and that he could not use it and was compelled to throw it away. That was the last cold cream I prepared for the Doctor with olive oil.

Coming now to the Pharmacopœia process, I also make an objection, although my objection may appear trifling to some pharmacists. I have reference to the rose water. When prescribed alone I believe the ointment meets the requirements of the physician, furnishing a cooling application to irritated or excoriated surfaces. It is bland, and makes a very elegant ointment; but when we have ointments to prepare like the following, which I frequently have occasion to dispense,

R Hydrarg. ox. rub	grs. vi	R Zinci oxidi,	ʒiv
Ungt. aq. rosæ,	ʒi or	Ungt. aq. rosæ,	ʒi
M. ft. ungt.		M. ft. ungt.	

then I contend there are objections to the present formula. After rubbing the oxide to an impalpable powder, preparatory to mixing it with the cold cream, then comes the trouble in mixing the powder and ointment; most of the water is pressed out, thereby losing at least about 15 per cent. of its weight, furnishing a salve much stronger than perhaps the prescriber is aware of, besides the annoyance and inconvenience the apothecary has to contend with. The object of the writer is to present a formula for an ointment which he has been using for some time with perfect satisfaction, and which will obviate this objection and fill all requirements equally as good if not better than the

ointment of the Pharmacopœia. As it contains no water, it is proposed to name it *Unguentum Rosæ*. The following is the formula :

R	Ol. amygd. dul.,	.	.	.	.	.	.	℥ix
	Cetacei,	.	.	.	.	.	.	℥iss
	Ceræ albæ,	.	.	.	.	.	.	℥i
	Ol. rosæ,	.	.	.	.	.	.	grs. vii

Melt together, over a gentle heat, the oil, spermaceti and wax, and when it commences to cool add the oil of rose, and constantly stir until cold.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

Determination of the Presence of Iodine and Chlorine in Bromine.—Ernst Biltz suggests the following tests :

1. *For Iodine.*—Dissolve the bromine in 40 times its bulk of water, macerate the greater portion of this bromine water with powdered iron, allow to settle, decant, add solution of starch to the decanted liquid, and then add a few drops of bromine water ; the presence of iodide of iron will then be indicated by the immediate formation of a blue layer of iodide of starch beneath the upper yellow liquid. The author claims that this test will yield a reaction if the bromine contains $\frac{1}{50}$ per cent. of iodine.

2.—*The test for chlorine* is that proposed by Duflos, who treats the bromine with ammonia water (thus forming bromide of ammonium), digests this solution with barium carbonate, filters, evaporates to dryness, heats to redness, and treats the residue with absolute alcohol, which will not dissolve chloride of barium.—*Pharm. Centralb.*, Sept. 19, 1878, p. 354.

Presence of Phosphoric Acid in so-called C. P. Hydrochloric Acid.—E. Holdermann strongly recommends the testing of all chemicals and preparations purchased, stating that a chemical analysis of acidum hydrochloricum purum, obtained from one of the largest chemical laboratories proved it to consist of 89.25 per cent. of officinal (Ph. Germ.) phosphoric and 10.75 per cent. of officinal hydrochloric acid ; both acids had probably been mixed accidentally.—*Arch. d. Pharm.*, Aug., 1878, p. 101.

Chili Borates and Boracic Acid.—Chili saltpetre-caves and their surroundings yield a large percentage of borates and boracic acid. C. Reichardt publishes the following constituents of a new pulverulent Chili mineral, analyzed by him :

Water,	18.107	Sodium chloride,	3.703
Sand and clay,	15.056	Potassium chloride,	1.310
Silicic acid,	0.070	Calcium sulphate,	32.247
Oxide of iron and aluminium,	0.840	Sodii boras, = $\text{Na}_2\text{B}_2\text{O}_7$ =	26.611
Lime,	0.727		—
Magnesium chloride (MgCl_2),	1.109		99.840

The mineral contains 18.594 per cent. of boracic acid.—*Arch. d. Pharm.*, Aug. 1878, p. 134.

Salicylic Cotton, Benzoic Cotton and Liquor Aluminæ Aceticæ as Antiseptics.—5 per cent. *salicylic cotton* is made, according to Prof. Paul Bruns, by saturating 1 kilo of cotton with 4 liters of a solution of 50.0 grams salicylic acid, 20.0 grams castor oil (or castor oil and colophony, each 10.0 grams), in 3.930 liters (3930 cc.) of alcohol.

10 per cent. *salicylic antiseptic cotton* is made by saturating 1 kilo of cotton with a solution of 100.0 grams salicylic acid, 40.0 grams castor oil (or castor oil and colophony, each 20.0 grams), in 4.860 liters (4860 cc.) of alcohol.

Benzoic cotton is made in the same manner, substituting benzoic for salicylic acid.

Liquor aluminæ aceticæ is considered by the author far superior to thymol, carbolic and salicylic acid, etc., for disinfecting purposes, for dressing wounds and for permanent antiseptic irrigation; he uses a diluted 3 per cent. solution, prepared from 72.0 grams alum, 115.0 grams acetate of lead, and sufficient water to make the filtrate measure a pint; this solution he frequently dilutes with 3 to 6 times its bulk of water.—*Pharm. Centralb.*, Sept. 26, p. 361-362..

Detection of Organic Poisons.—E. Heintz proposes to evaporate the liquid containing organic poisons with white bole, previously treated with hot hydrochloric acid and well washed with water. The residue is exhausted with chloroform or other solvents, and retains fats, resins and other impurities.—*Zeitschr. f. Anal. Chem.*, 1878, p. 166.

NOTES ON A NEW DOUBLE IODIDE.

BY FREDERICK W. FLETCHER, F.C.S

Read at the British Pharmaceutical Conference.

The strong tendency exhibited by many of the iodides to form double salts is well known. Within the last ten days a new and striking instance of this characteristic feature has come under my notice, and the compound produced is in many respects so remarkable, that I venture to submit the few notes which I have been able to make respecting it, to the consideration of the Conference.

In experimenting upon a complex solution, which amongst other things was known to contain a salt of quinia, I was somewhat astonished to find a copious scarlet precipitate produced on the addition of potassium iodide. The color was not sufficiently vivid for that of mercuric iodide, and with the exception of the little-known but curious double iodide of mercury and copper, no iodide with a like appearance produced under similar conditions, suggested itself.

Having collected and washed the precipitate, I proceeded to examine it qualitatively, when it was found to contain besides the halogen, bismuth and quinia. Solutions of these last two substances were then prepared and mixed, and I found that not only in each case was this brilliant precipitate obtained on the instant that an iodide was introduced, but that by experimentally regulating the proportions of the three salts, it was possible to remove the whole of the quinia, the bismuth and the iodine from the solution in the form of this beautiful double salt.

A few ounces of the compound having been carefully prepared, I submitted a portion to analysis in order to ascertain the relative proportions in which the elements present were combined, and thus arrive at its proper formula.

The bismuth was thrown down from a solution of the salt in ammonium citrate containing excess of acid, by hydrogen sulphide, 1 gram yielding .322 gram Bi_2S_3 , equivalent to 26.2 per cent. of metal.

The quinia was estimated in a similarly prepared solution by Allen's ether method, a process which always gives unexceptionable results.

1 gram of the salt yielded .202 gram anhydrous quinia, or 20.2 per cent.

The iodine was separated as a silver salt, 1 gram yielding .989 gram AgI , equal to 53.4 per cent. of iodine.

From these results it is evident that the salt is a compound of tri-iodide of bismuth and hydriodate of quinia, in the proportion of two molecules of the former to one of the latter substance, and it would therefore have the formula $(\text{BiI}_3)_2\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2\cdot\text{HI}$.

The theoretical and actual results bear the following relations :

	Calculated.	Found.
Bismuth,	25.7	26.2
Quinia,	19.9	20.2
Iodine,	54.4	53.4

The salt is very sparingly soluble in cold, but more freely in hot water.

Rectified spirit dissolves it slightly in the cold, but very readily when warmed.

It is completely taken up by an alcoholic solution of potassium iodide, forming a brilliant crimson solution.

It is decomposed by the stronger acids with liberation of iodine. Digested in strong solution of ammonia, its color is destroyed, and an insoluble residue of oxide of bismuth and quinia remains.

Gradually heated in a porcelain crucible, it at first fuses to a shining purplish-black mass, and as the temperature increases, fumes of iodine together with scarlet colored vapors are evolved, which condense upon a cold surface, in a particolored deposit, which presents under the microscope a crystalline structure.

When a few grains of the salt are rubbed upon paper and gently warmed, like the double iodide of mercury and copper, it becomes black, regaining its original color gradually, if allowed to cool spontaneously, and instantly if the paper be laid upon something cold, such as a steel knife or bottle of water.

Whether this compound possesses any special medicinal value is a point which, of course, experiment can alone determine. All that can at present be said is, that if it is desired to administer quinia and bismuth in conjunction with iodine, the salt under notice affords an admirable method of doing so.

From a chemical point of view, the salt is interesting, and the decomposition which gives rise to its formation might possibly be found of value as the basis of a volumetric process for the estimation of salts of bismuth and quinia.—*Pharm. Jour. and Trans.* [Lond.], Sept. 28.

SOLUTION OF IODOFORM AND IODOFORMED LINT.

By G. A. KEYWORTH, F.C.S., Hastings.

Read at the British Pharmaceutical Conference.

When iodine tincture is shaken with a fragment of fused potash so as to remove the color, the essential step in the preparation of iodoform, the characteristic odor of that substance appears. In this simple form the fluid possesses great energy as a therapeutic agent, more especially in the healing of indolent sores, for which purpose iodoform is so highly valued by some medical practitioners. Iodine ointment of various strengths, alone or combined with a small quantity of carbolic acid, has long been known to have great power in producing cicatrization and granulation with obstinate ulcers, sores and wounds. The odor of iodoform, which is to many persons very repulsive, may be readily concealed by the addition of eau de cologne or lavender water.

The alcoholic solution above described, when so treated, furnishes an elegant substitute for iodine tincture, with its dark color, strong chlorine-like odor, and staining property. Lint soaked in this colorless perfumed liquid, and allowed to dry, is a singularly useful application for various sores, promoting the healing process with much energy. Equal parts of this fluid and glycerin form a very useful combination for many purposes.—*Phar. Jour. and Trans.* [Lond.], Sept. 14.

THE EXTRACTION OF EMETIA FROM THE DEPOSIT IN VINUM IPECACUANHÆ.

By GEORGE BROWNEN, F.C.S.

Read at the British Pharmaceutical Conference.

It is not my intention to direct the attention of this Conference to the chemistry of ipecacuanha; that has been done by our secretary, Professor Attfield and others. At the Birmingham meeting in 1865, a paper was read by Mr. Johnson, in which some of the causes at least of the instability of ipecac wine were noticed and suggestions made; yet in the revision of the Pharmacopœia after that date these suggestions were either set aside or forgotten and the same objectionable and unsatisfactory formula is preserved by authority in the Pharmacopœia of 1867.

I do not intend to dilate on the turbid solution and unsightly deposit which continuously forms as long perhaps as there is anything in the

form of alkaloid to deposit from this wine; neither do I ask you to decide which course should be followed by the dispenser, filtration and consequent weakening of the wine or the use of a turbid inelegant mixture. Ipecacuanha wine will deposit, if made according to the official formula, and that deposit will contain the most valuable and perhaps the *only* valuable constituent of ipecac root, and being mixed with the crystalline tartar adheres to the sides and bottoms of the vessels containing the wine; even if it becomes detached it is not readily or easily diffused by agitation, but is often rejected and thrown away.

Quite recently a considerable quantity of these deposits and incrustations came under my notice, and I determined to try and see if some use could not be made of this waste product.

The semi-crystalline mass was therefore made into a paste with water, and then mixed with calcined magnesia until a marked alkaline reaction was obtained. Calcic hydrate was tried, but the evolution of ammonia and other changes led me to suppose that the emetia might be affected by the lime. After standing for twenty-four hours, the mixture was slightly warmed to complete the reaction, and the resultant mixture spread in thin layers and dried as rapidly as possible at a low temperature. The mass was next reduced to powder and percolated with spirit of wine. The alkaloid associated with some impurities was thus abstracted from the other salts, and it was possibly pure enough to fortify a "weakened" ipecac wine if the necessary proportions were known. Such, however, was not my purpose. The alcohol was therefore removed by evaporation and the emetia dissolved in dilute acetic acid and then precipitated by ammonia; the emetia obtained was fawn-colored and tolerably pure, completely soluble in acids, and precipitated by Sonnenschein's and the other alkaloidal tests.

The process I have described is an adaptation of the process of MM. Pelletier and Dumas, and by this method a considerable proportion of alkaloid may be obtained from the brown-colored crystals and slime, which the pharmacist in his disgust is sorely tempted to throw away as a nuisance and loss.

In Watt's dictionary, vol. ii, page 485, under the heading "emetine," I find the following: "The gallotannate is a white flocculent precipitate soluble in alkalis, it is *neither emetic nor poisonous*." May not this compound be formed in old ipecacuanha wine and be the cause of its uncertainty and partial inertness even when the wine was "well shaken before taken?"—*Phar. Jour. and Trans.* [Lond.], Sept. 14.

NOTE ON AN IMPROVED PREPARATION OF ERGOT.

By A. W. POSTANS, F.C.S.

Read at the British Pharmaceutical Conference.

It is only right to preface my remarks on this subject with a statement to the effect that the liquid extract I desire to bring before the Conference is what I have considered to be an improvement on the process given in the Pharmacopœia of the United States of America, and the resulting preparation is possessed of stability, activity and good keeping power.

It is at once obvious that however highly esteemed by some medical men the freshly-powdered ergot may be, yet a fluid extract on which reliance can be placed has such manifest advantages in convenience of exhibition, accuracy of dosage, etc., that to find one even equal to the freshly-powdered ergot is a gain.

In the following observations I do not propose to analyze the different samples of ergot, although that is a most important starting point. I do not propose to suggest any new method for the preservation of ergot itself, nor to assert positively to what it owes its activity, and the general history of the drug, as well as its adulterations and occasional admixture with ergot of wheat, ergot of oat, and various other inferior ergots, is so exhaustively dealt with in Pharmacographia that I may fairly pass on; with the intimation, however, that I shall hope, on a future occasion, to give an account of the value of liquors obtained from ergot of oat and ergot of wheat.

The process I have adopted is as follows:

To 20 ounces of freshly-powdered ergot packed in a percolator, the extremity of which had been closed, was added a mixture containing ten ounces each of rectified spirit and glycerin, and 5 ounces of water; the whole was then allowed to macerate for a week, at the expiration of which time the percolation was proceeded with, and the subsequent displacement continued with distilled water until the drippings almost ceased to have any taste or color. Eighteen ounces having been collected of the first liquid, the remainder was evaporated gently in a water-bath to 2 ounces, and then mixed with the previous quantity, so that 20 ounces of this fluid extract exactly represents 20 ounces of freshly-powdered ergot; and I am told by several obstetricians of eminence that it is highly satisfactory.

In conclusion, I desire to point out that the main difference between

the above process and the American consists in the addition, by the United States Pharmacopœia, of half an ounce of acetic acid to each 16 ounces of liquor, thus rendering, in my opinion, an otherwise good preparation nauseous and unpalatable, as well as presenting a difficulty as to the desirability and wisdom of introducing acid into the stomachs of patients. These are points which, at certain times, it is most necessary for the physician to consider and the pharmacist to determine.—*Phar. Jour. and Trans.* [Lond.], Sept. 14.

A REACTION OF ORANGE FLOWER WATER.

BY R. REYNOLDS, F.C.S., and C. H. BOTHAMLEY.

Read at the British Pharmaceutical Conference.

A few months since, the following prescription was presented, and was duly dispensed :

R	Bismuth. alb.,	.	.	.	.	5iss.
	Acid. nitro-mur., dil.,	.	.	.	.	5iss.
	Tinct. gentiar. co.,	.	.	.	.	5ss.
	Sp. chloroformi,	.	.	.	.	5iss.
	Aqua aurantii,	.	.	.	ad	5viii.
	Misce.					

The patient complained that the mixture, including the deposit, had a pinkish hue, which was not the case to such a degree when the same medicine had been dispensed elsewhere.

Some experiments showed that the coloration was due to a reaction between the orange flower water and nitro-hydrochloric acid. Although we believe that few pharmacists have had this reaction brought under their notice, the fact is already recorded in Hanbury and Flückiger's "Pharmacographia" where it is said of orange flower water, "Acidulated with nitric acid, it acquires a pinkish hue more or less intense, which disappears on saturation by an alkali."

The literature of the question is contained in its most complete form in Gmelin's "Handbook of Chemistry," vol. xiv, page 386. Here we find the following statements under the head of Oil of Neroli, viz., When orange flowers are distilled with water, "the oil which passes over is a mixture of two oils, one easily soluble in water and fragrant, the other sparingly soluble, of less agreeable odor; the latter floats upon the watery distillate and is easily separated (Soubeiran). Orange

flower water, treated with nitric acid, acquires in a few minutes a rose-red color (Ader and others). With oil of vitriol, it becomes rose-colored (LeRoy); but Ader insists that this is only the case when the oil of vitriol contains nitric acid, and, he adds, that it is not colored by hydrochloric acid. Ether, almond oil and castor oil abstract from orange flower water the whole of the volatile oil; the ether solution, mixed with nitric acid, immediately assumes a rose-color and leaves, on evaporation, a fragrant volatile oil (Ader, 1830, 'Journal de Pharmacie,' also Soubeiran)."

Our experiments may be divided into two sections; firstly, the isolation of the soluble oil; secondly, its reactions.

I. In order to separate the soluble oil, 300 cc. of orange flower water were introduced into a glass tube about 1 meter in length and 20 mm. diameter, having its lower extremity drawn out and closed by a pinch cock and india rubber tube, as in Mohr's burette, whilst the upper end was drawn out and fitted to receive a small cork; 60 cc. of absolute ether were added, and thorough agitation effected. After separation, the operation was repeated with 30 cc. of fresh ether. The mixed portions of ether were placed in a small distilling flask, and the ether was evaporated in a current of air. Some of the volatile oil may have passed off with the ether, and a slight odor favored this supposition, but as the flask was constantly coated with ice, owing to the refrigeration caused by the rapid volatilization of the ether, the process of evaporation could hardly have been effected more favorably as regards the avoidance of loss. The oil obtained weighed 2.126 grams = 0.71 per cent. upon the orange flower water used. It had solidified towards the close of the process, but rapidly liquefied when evaporation ceased; it possessed a deliciously fragrant odor.

II. The reactions of the oil with nitric acid (normal strength, 63 grams per liter) are those stated for orange flower water by previous observers, but intensified in degree. The color may be described as crimson-red; that with orange flower water is faint red. We have to differ with Ader on two points, viz., we find that pure sulphuric acid produces the rose-color with orange flower water, and that hydrochloric acid does the same; both reactions being much less marked than with nitric acid.

The orange flower water after exhaustion by ether gave no trace of coloration with nitric acid. It was not, however, absolutely deprived

of odor, but had lost its characteristic scent, and now possessed an odor suggestive of rose water.

We may add, that if strong nitric acid be added, drop by drop, to orange flower water, the rose-color at first produced is destroyed when the quantities of the two liquids are about equal.

If the orange flower water be agitated with nitrous fumes and dilute nitric acid then added, no color is produced, or if acid, largely charged with such fumes be added to orange flower water the color appears for an instant, but is almost instantly destroyed.

Before leaving the subject of orange flower water it may not be inappropriate to its bearings on pharmacy to quote from Parrish's "Pharmacy" (ed. 1859) the following statement; "Its sedative effects, which are not generally known in this country, and not noticed in our works on *Materia Medica*, adapt it especially to use in nervous affections. In doses of a tablespoonful, it is found to allay nervous irritability and produce refreshing sleep." If orange flower water has valuable hypnotic qualities it should be welcomed as a desirable rival to various less innocent substances now used for the purpose.—*Pharm. Jour. and Trans.* [Lond.], Sept. 28.

NOTE ON PHOSPHORUS IN THE PILL FORM.

BY A. W. GERRARD, F.C.S., Teacher of Pharmacy at University College.

Read at the British Pharmaceutical Conference.

During the past four years much has been said and written about the dispensing of phosphorus, and various methods have been suggested for presenting this active and useful drug in a form which shall be at once reliable, uniform and elegant. Of the various novel suggestions made none seems to have received anything like a general adoption; and glycerin, resinous and albuminous solutions of this drug are rarely or never seen in the physician's prescription.

Of the two methods by which phosphorus can be exhibited, solid and liquid, the pilular or solid is that to which preference is mostly given, and this preference may be explained upon good reasons. For instance, the material in which the phosphorus is diffused in a pill is small in bulk as compared with an emulsion or mixture, therefore the phosphorus in the pill is more likely to be preserved from change or loss by oxidation and to yield a more uniform therapeutic effect. Again, as a

rule pills do not produce the nauseating effects of a dose of phosphorus in the fluid form ; pills are also more convenient and portable.

Of the various methods recommended and mostly used for rendering phosphorus into pills I shall mention two, and the objections attached to them. The first method is to dissolve phosphorus in carbon disulphide, to pour this upon compound tragacanth powder, and make into a mass with water. The other method is to dissolve phosphorus in melted cacao butter, and when cold rub smooth in a mortar, and divide into pills. Of these two processes I give the preference to the former, as the latter is most impracticable, for from the greasy nature and low melting point of cacao butter it cannot be handled without clothing the fingers with a covering of phosphorescent fat, very annoying to the operator, and the mass does not yield well and regularly under the pressure of the pill-cutter, but breaks into irregular fragments, which necessitates a remixing. My principal objection, however, to both processes is that much loss of phosphorus takes place by oxidation during the process of manipulation, and unless the manipulation be dexterously and expeditiously carried out this loss is considerable ; the prevention or reduction of this loss to a minimum is the main object of this note, and the following is the process I have employed for a period extending over a year with very good results.

I will give a formula for thirty pills, each pill to contain one-thirtieth of a grain of phosphorus.

Take of	Phosphorus,	1 grain.
	Carbon bisulphide,	20 minims.
	Compound tragacanth powder,	90 grains.
	Chloroform,	a sufficiency.
	Water,	a sufficiency.

Place the phosphorus in a wedgwood mortar, pour over it the carbon bisulphide, then add the tragacanth powder and ten minims of chloroform, mix into a uniform product, then add water a sufficiency to form a pill mass, maintaining during the whole of the process the presence of chloroform ; divide into thirty pills.

The novelty in this method depends upon the presence of chloroform, and the explanation of the part it serves is as follows : Whilst chloroform is present in the mortar it forms a heavy vapor which surrounds the phosphorus, preventing the contact of air and the consequent oxidation ; of course, as soon as the materials are kneaded into

the necessary uniform mass, the whole of the chloroform is allowed to evaporate; when the chloroform has evaporated, some surface, and only surface, oxidation takes place.

In conclusion, I would advise those who wish to try the experiment of dispensing phosphorus to compare the method I have given both with and without chloroform. In the one case you have much phosphorescence and irritating fumes evolved; in the other there is no apparent phosphorescence and very little fume. In fact, I have worked eight ounces of mass into pills easily by this new process, which otherwise would almost have been an impossibility. The greatest advantage, however, I consider it offers is that the patient gets the nearest possible approximation to the dose given in the prescription.

Mr. Greenish said he had paid some little attention to the dispensing of phosphorus pills, and the plan he adopted was somewhat different to that described. He dissolved the phosphorus in bisulphide of carbon, then mixed the cacao butter with it, and after that anything else required. By putting the cacao butter into the mortar with the solution he considered the difficulty mentioned by Mr. Gerrard was got over.—*Pharm. Journ. and Trans.* [Lond.], Sept. 28.

PLANTS USED by the INDIANS of the UNITED STATES.

BY DR. EDWARD PALMER.

(Concluded.)

TEXTILE PLANTS.—*Yucca baccata*. This is one of the most useful plants to the Indians of New Mexico, Arizona, and Southern California. Its fruit is eaten while fresh and in the dry state. It grows from two to eighteen feet in height, and becomes a tall tree further southward, varying in diameter from eight to twenty inches. The bodies of these plants are very fibrous. The Indians and Mexicans when in want of soap cut the stems into slices, beat them into a pulp, and mix them with the water when washing as a substitute for soap, for which it answers finely. The leaves are generally about two feet in length and are very fibrous. In order to remove the bast the leaves are first soaked in water, then pounded with a wooden mallet, at the same time occasionally plunged into water to remove the liberated epidermis. Then if not sufficiently clean and white it is returned to the water for a time and again put through the beating process; generally the second course is sufficient. The fibres of the leaves being strong, long and durable are adapted for Indian manufactures, and the savages of Southern California make therefrom excellent horse blankets.

All the tribes living in the country where this plant is found use it to make ropes, twine, nets, hats, hair brushes, shoes and mattresses.

The Diegeno Indians of Southern California have brought the uses of this plant to notice by the various articles they make from its fibres, and sell to white settlers. In preparing a warp for the manufacture of saddle blankets, it is first loosely twisted, then when wanted it receives a firmer twist. If the blanket is to be ornamented, a part of the warp during the first process is dyed a claret brown, oak bark being used for that purpose. The loom in use among the Indians of to day is original with themselves, and not borrowed, as some suppose, from the Spaniards. It is a simple affair, consisting of two round, strong, short poles, one suspended and the other fastened to the ground. Upon these is arranged the warp. Two long wooden needles with eyes are threaded with the filling which is more loosely twisted than the warp, in order to give substance or body to the blanket. Each time that the filling is thrust between the threads of the warp by one hand, the Indian female with a long, wide, wooden implement in the other hand, beats it into place. This tool resembles a carving-knife, but is much larger and longer. One edge is thin, and in this is made a number of teeth or notches not so sharp as to cut.

This plant, so fibrous and so abundant on land utterly worthless for the growth of anything more valuable, can be had for the gathering; and as paper materials are scarce, either alone or mixed with straw, would be valuable in the manufacture of that article.

Y. brevifolia.—The leaves of this plant are short, and not useful for Indian purposes, but it produces abundance of large seeds which contain much nutrition; they are ground fine, and either eaten raw or cooked in the form of mush by Southern California Indians. Vast tracts are covered with it, which assume a forest-like appearance about the Mojave river, Southern California, having trunks from ten inches to two feet in diameter, and twenty-five feet high, with numerous branches. Not only is the leaf fibrous, but the body is more so. As raw material for paper it is excellent.

Y. Whipplei.—This plant in bloom is one of the finest garden ornaments, very common over most parts of California. The young flowering stems, while in their tender condition, are either eaten raw or roasted by the Indians. The seeds are gathered, ground into flour and eaten. The leaves yield a very soft white fibre, which is capable of being made into very nice thread. Indians use this fibre to form a padding to their horse blankets, the outer part of which, being made of the fibre from the *Yucca baccata*, is very rough. A wooden needle is threaded with twine made from the same fibre, and the lining is firmly quilted to the saddle blanket, forming a soft covering, without which it would injure the animal's back.

Y. angustifolia, a very common plant in Utah and Arizona; the leaves yield the softest fibre of all the *Yuccas*, and, like all of them, is adapted to manufacturing purposes, especially for paper. The young flowering stems are used by Indians after the manner of asparagus; the same may be said of all the *Agaves* and *Yuccas*. They are eaten cooked or raw, and are not to be despised. The root is used, after being pounded up, as a substitute for soap.

Agave utahense.—The Pah-Utes strip the leaves from the heart of the plants of this species, then heat stones, upon which the hearts are laid; the youngest leaves are next placed on, then weeds or grass, and finally a coating of earth over all. This

kiln remains three days, or until the contents are cooked, then it is uncovered. The hearts are either consumed as food immediately, or pounded fine and pressed into flat, long, irregular-shaped cakes, about ten inches wide and fifteen long. They have a pleasant sweet taste, but the dirty black color might be objectionable to some. It is very nutritious, and the Indians of Utah become quite fat while living upon it. The tender inner leaves, baked with the hearts, are pounded and pressed by the hands into flat cakes, but are not so sweet or palatable as the hearts, and are full of fibres of a brown color. Its fibrous nature adapts these cakes for transportation. Indians in traveling or hunting carry them tucked under their belts, and take off pieces as they go along to chew, spitting out the fibre or use it for gun wads. The hearts of all the *Agaves* when roasted yield this palatable kind of food.

A. deserti.—This is on the whole one of the most useful of natural productions to the Arizona, New Mexican and Lower California Indians. The heart of the plant, after being roasted, is a nutritious article of diet; from it is distilled a strong liquid called *mescal* by Mexicans; the seeds are ground into flour and eaten; the leaves are long and very fibrous, and are cleaned like those of *Yucca baccata*. Sometimes, after the leaves are dead and quite dry, they are pounded until the epidermis is separated. The fibre thus cleaned is not so smooth and white as that soaked first in water, but very strong and durable ropes, mats, nets and sewing thread are made therefrom. This is a very abundant plant, covering many thousands of acres of land, unfit to grow anything more useful. A plant that contains so much fibre, surpassing in length and strength many other fibres in use for cordage and for paper, must some day be cultivated on the desert wastes of the United States.

A. Shawii, one of the finest garden plants, but the fibre is only suitable for paper, being short. The Indians are very fond of a sweet honey-like nectar found in the base of its flowers; in fact, it tastes like honey and water. It is only found near San Diego, California.

WILLOW TREES.—Those along the Colorado river, Arizona, yield abundance of long, soft bark, from which the Indians on this stream make ropes and twine for domestic purposes, as well as sandals and mats. The females generally dress scantily; only that part of the body from the waist to the knees is hidden from view. This custom is observed by most of the Indian females living along the Colorado river. They strip off the bark from the willow trees and bury it in blue mud for a few days, after which it is taken out, washed clean and dried. It is now soft, pliable and easily handled. Being cut into requisite lengths, they are fastened very thickly to a belt of the wearer.

The Colorado river Indians are said to make a fine drink from the flowers of the willows.

Apocynum cannabinum.—The Indians of Southern Utah, California and Arizona use the fibre prepared from the stems of this plant to make ropes, twine and nets, and before the advent of Europeans it was used in the manufacture of various articles of clothing. In order to remove the fibre the woody stems are first soaked in water, the bast with the bark is then easily removed. The latter being washed off, leaves a soft, silky fibre of a yellowish-brown color, which is very strong and durable. I have seen ropes made of it that have been in constant use for years.

Urtica holosericea.—The fibre of this plant is used by the Indians of Southern California to make their bow strings. In order to separate the fibre the plant has to go through the same process as hemp; its fibres resembling that of the latter, being equally strong and durable.

Cowania mexicana.—This tree before the advent of Europeans was the great source from which the Nevada and Utah Indians obtained the materials for their dress goods. The outer bark is rough, but the inner is soft, silky and pliable, and of a brownish color. It is removed in long strips, varying in width, a desirable quality in a bark that is used in the manufacture of clothing, sandals and ropes. These articles were formerly made by braiding strips of bark together, or woven with the hand loom. Females made skirts from strips of this bark by braiding a belt to which they suspended many strips of the same material, hanging down to the knees like a long fringe; the rest of the person was naked in summer. Mats were also made from this bark which were used as beds.

MEDICINES.—*Chlorogalum pomeridianum*, common soap root of California, and called by Indians and Mexicans *Amole*. It produces a large bulb which yields a great quantity of saponin, very good for washing, for which purpose it is much used by poor people and the Indians of California. The rough covering of the root is formed into bunches tied up and used for hair brushes by the Indians.

Datura meteloides (Jamestown weed).—The California Indians make a decoction of this plant which is given to young females to stimulate them in dancing. After the root is bruised and boiled in water, the liquid, when cold, is taken internally to produce a stupefying effect, and is much used by California Indians.

The Pah-Utes call this plant *Main-oph-weep*. They bruise the seeds, soak them in water and expose the mixture to the sun's rays to cause fermentation. This being effected, the liquid is drank and has the same narcotic effect as the preparation made from the plant or root, with the alcoholic effect added.

Nicotiana trigonophylla, *N. Bigelovii*, *N. attenuata*.—The leaves of all these species of *Nicotiana* are used as tobacco by the Indians of Arizona, Utah, New Mexico and Southern California. The strength is said to be greater than that of the cultivated variety, though the leaves are smaller.

Ligusticum apiifolium, Angelica of the settlers of Utah, *Pahnet-snap* of the Pah-Utes.—It is a favorite medicine with these Indians. The root is bruised and used as a poultice for sprains and bruises. A tea is made from the roots and is taken internally for pain in the stomach. The Indians if afraid of catching contagious diseases fill their nostrils with pieces of the root. The strong, aromatic, carrotty smell may have induced them to believe in the efficacy of this plant as a prophylactic.

Berberis aquifolium or *Oregon grape*.—From the roots of this plant a decoction is made in water, or they are steeped in liquor, and taken internally. It is a good remedy for general debility, or to create an appetite, and is considered equal to sarsaparilla in its medicinal virtues. It is a favorite medicine with the California Indians.

Anemopsis californica, *Yerba Mansa* of the Mexicans.—The root of this plant is a great remedy among the Indians of Arizona, and Sonora in Mexico, and Southern

California. It has a strong peppery taste and odor. A tea made from the roots and a powder prepared from the same and applied to venereal sores, are a great remedy. The powder is advantageously used on cuts and sores, as it is very astringent. The leaves, after being wilted by heat and applied to swellings, are a sure cure.

Achillea millefolium, Yarrow of the settlers of Utah. The Pah-Utes make a tea from this plant, and take it internally for weak and disordered stomachs. It is much used by whites in the form of bitters.

Curcubita perennis, called Chili Cojote by Mexicans.—The pulp of the green fruit is used, with a little soap, to remove stains from clothing. The roots of this plant are large and long, and when macerated in water, are applied to piles, generally with good effect. The seeds are ground fine and made into mush, and eaten as food by many Indians of Arizona and Southern California.

Euphorbia polycarpa, called by Mexicans Golendrina.—A strong decoction made from this plant and applied to snake bites soon produces reaction. Many cures effected in this way are reported. In fact, the Indians of Arizona and Southern California rely entirely upon it in such cases. Some years since, being in San Diego, and wading in the salt water, a fish (*Sting-Ray*) plunged the bony projection at the base of its tail into my left foot, and soon the swelling and pain became excessive. A Mexican woman made several gallons of a very strong decoction from this plant, and plunged my leg up to the knee into it while hot, and in a few hours relief came.

Eriogonum glutinosum, *Verba Santa* of the Mexicans, and a great medicine among the Indians of Southern Utah, Arizona and California. A decoction made from this plant, and taken internally for rheumatism and partial paralysis, or applied externally, is an excellent remedy. For affections of the lungs, the leaves are used by smoking or chewing dry, or a tea is made from them and drank.

Micromeria Douglasii, *Verba Buena* of the Mexicans.—This is an interesting plant, growing near the sea-coast of California, having a strong minty smell. It is a favorite medicine with the Mexican population of California. The Indians of the same section prepare a tea from it, which is used for fevers and colds. In case of headache, a quantity of the plant is bound round the head.

Artemisia tridentata, commonly called sage brush.—The Pah-Utes make a strong tea from this plant and take it internally for headache, colds and for worms. It is also a good stimulant, prepared either with water or liquor. It yields a pungent oil which would be a profitable article of commerce.

A. filifolia, *Southern wood*.—This plant on distillation yields a very penetrating oil which is good for liniments, and the Pah-Utes make a decoction from it excellent for swellings and bruises.

A. ludoviciana, *A. dracunculoides*.—The seeds of these two species are gathered by the Pah-Utes, ground fine, made into mush and eaten. It is anything but a tempting dish, having a dirty look and strong taste.

A. ludoviciana.—This plant possesses medicinal virtues. The Pah-Utes make a strong tea of it and use it internally to assist child-birth, whenever assistance is required, which is seldom. In case of hemorrhage from the nose they stuff wads of the fresh plant into the nostrils.

Oreodaphne californica.—This fine evergreen tree of California has a very strong spicy odor. By rubbing the hands and face a short time with the leaves a very distressing headache will be produced. Hahnemann is not the only discoverer of the fact that like cures like, for long before he was born the Indians of California were aware of the power which this plant had to produce a headache in those that were well and to cure those who are afflicted with it.

Erythraea venusta, a common remedy for ague by Indians and Mexicans of Arizona and Southern California. A tea is made of the plant and drank, and is certainly a very good substitute for quinia.

Peonia Brownii, by Mexicans called *Peo-neo*—The root of this plant is used by the Indians of Southern California for colds, sore throats and for pain in the chest. It is mealy and tastes somewhat like licorice. After being reduced to powder, it is either taken in that form internally or made into a decoction.

Grindelia squarrosa.—A decoction made from this plant is used by Mexicans and Indians of Southern California to cure colds. It is taken internally.

Lygodesmia spinosa.—This plant produces a short, fine, silky substance just at the juncture of the roots with the branches, which is used by the Digger Indians to stop the bleeding in gun-shot wounds.

Perezia arizonica.—At the junction of the branches with the roots, and covering the greater part of the former, is a soft silky substance which is used by the Apache Indians in gun-shot and other wounds, to stop hemorrhages, for which it is well adapted.

Glycyrrhiza lepidota, called by settlers of Utah, Desert root.—Pah-Utes eat it for its tonic effects. In taste it is much like licorice. Whites sometimes chew this root in place of tobacco.

Ephedra antispyphilica, called *teamster's tea*, since men traveling with teams in New Mexico, Arizona and Southern California, camping among Indians, contract venereal diseases, and use this plant abundantly as a remedy, taken internally in the form of tea. A quantity of the plant is often taken along in case of need. This is a well-known remedy for gonorrhœa among many Indians and Mexicans. It is a strong astringent, and may prove valuable for its tonic properties.

DYEING MATERIALS.—*Rumex hymenosepalus*, a species of dock, is very abundant in sandy localities of mountain districts, and along river bottoms in Arizona and Southern Utah. Indians use the root for tanning buckskins. Moccasins made from leather thus tanned are rendered much more durable, and less liable to injury from moisture. It is also used in dyeing, as it yields a bright brown or mahogany color. Occasionally, Indians ornament their bodies by using this substance to form designs upon their limbs. Males, especially, go more or less naked all the year round. The people of Utah use the leaf stem, as a substitute for rhubarb, to make pies.

Sueda californica.—At San Diego, California, it is commonly called glass wort, from the glassy brittleness of the stem. It yields much caustic potash, the ashes of which are used by soap makers. Indians gather the seed for food. The plant also yields a dark coloring matter.

S. diffusa, *Sab ap-weep* of the Pah-Utes—The seeds of this plant are very small, nevertheless they are gathered in great quantities. They are very difficult to clean,

but the Indians are glad to obtain them. They are ground fine and made into biscuits. The seeds have a decidedly salty, potash taste. The flour tastes best when made into mush. The Coahuila Indians of Southern California make a fine black dye by steeping a quantity of this plant in water. For coloring their baskets black, they take some mature rushes and steep them several hours in this black dye, which is very penetrating, and the color is durable, but it has a very fetid, disagreeable smell.

Dalea Emoryi, *D. polyadenia*.—Branches of this plant steeped in water form a bright yellowish-brown dye, and emit a strong rue-like odor. The Coahuila Indians of California, to ornament their baskets of a yellowish-brown color, steep their rushes in a dye of that color prepared from these *Daleas*.

Larrea mexicana, *Tah-sun-up* of the Pah-Utes.—It is one of the commonest plants of Southern California, Lower California, Arizona and Southern Utah. A lotion made by steeping branches of this plant in water, and applied to sores of man or beasts, proves very efficacious, and a powder prepared from the dry leaves is good for chronic sores. From the old wood exudes an abundance of a gum, which is softened and used by the Indians to cement their flint arrow heads into their shafts. The Apache Indians use this gum as a styptic. The settlers of Utah often use this plant in dyeing, as it produces a greenish-yellow color, and garments thus dyed have the curious property of emitting a very disagreeable resinous odor ever afterwards on being heated. In consequence of the peculiar odor of the fresh plant, it is sometimes called creasote wood.

Garrya flavescens.—The fruit of this plant yields a violet coloring matter, which is used by Arizona Indians. The leaves are used for ague and for colds, made into a tea and taken internally.

Trichostemma lanatum.—By Mexicans and the Indians of Southern California it is called *Romero*. It is used by them to impart a dark or black color to the hair, and to promote its growth. A strong decoction is made of the leaves which is frequently applied to the hair. It is a very beautiful plant, with bright blue flowers which emit a strong odor of hops.

Orthocarpus luteus.—This plant yields a delicate pink color, which is used by the Nevada Indians.

Eritrichium micranthum.—The slender roots of this plant yield a delicate yellow paint, used by Indians of Utah.

Lithospermum longiflorum.—The root yields a purple color; it is the Puccoon of the Eastern Indians.

Polyporus officinalis, a fungus which yields a reddish coloring matter which at one time was much used by Indians to paint their faces. Now vermilion is so cheap that it has to a great extreme superseded this.

Evernia vulpina, a lichen which yields the highly prized yellow paint found so frequently among the Western Indians. The Apaches of Arizona carry a portion of it carefully in a small buckskin bag. It is considered a charm when applied to the face, and a cross of this color on their feet enables them to pass their enemies unseen.—*The American Naturalist*, Sept.

CHINESE PHARMACY IN THE UNITED STATES.

By RICH. V. MATTISON, PH.G.

Sauntering along one evening with some friends in the City of the Golden Gate, discussing the pharmacy of the past and that of the immediate future, we thought a visit to the Celestials would be *apropos*, so we dropped into the shop of Mr. Fook Sing Tong to chat about the price of drugs and the probability of an early agreement on the subject of an International Pharmacopœia.

The representatives of the oldest nation not being so communicative to our body as we desired, we soon transferred ourselves to the shop of Messrs. Chun Wo Tong & Co., who have the best arranged pharmacy, probably, among the Orientals of the coast. Here we were cordially welcomed, and, after an interchange of courtesies, which consisted on their part of the usual tea-drinking ceremony, we proceeded to inspect the pharmacy.

The junior partner we found engaged in the preparation of a large quantity of pills. In this case *secundum artem* means that the powders are beaten up into a mass, a mortar being used and the pestle manipulated in true Occidental style. When the mass is of sufficient tenacity, it is held in one hand and with the other pulled and rolled into a pipe of about the thickness of a stick of liquorice, and then, with one hand still grasping the pipe, sufficient is pinched from the end by means of the finger nails, which are kept long for the purpose, to make a pill; this is rolled between the thumb and fore finger until quite spherical, when it is dropped into a pan, where after a sufficient number have accumulated, they are placed in a warm place to dry. The whole process is one of astonishing accuracy and dexterity. The mortars used are of brass, the usual shape and size; the pestles are of wood, with a brass "nose" at the apex firmly joined to the wood. Each mortar is furnished with a leather cover, which in its centre is pierced with a hole for the passage of the pestle.

All drugs are prepared for use or sale in the following manner: The drug is carefully steamed, and then, while soft, is cut, usually transversely, in very thin slices, by means of a machine resembling a straw cutter or tobacco knife. Perhaps liquorice root is a good example of the preparation of similar drugs. It is first steamed, then decorticated, and then sliced and placed in the sun until perfectly dry. No artificial heat is used. It is then ready for sale. Its appearance by this time is about as unlike liquorice root as it is possible to get it. Orange and lemon rinds are treated in the same manner, and come into the market in the favorite chipped beef style.

The Oriental has no liquid preparations to trouble him, but his profession is thoroughly in the line of practical pharmacy. Think of it, pharmacists of a civilized community! Not an elixir to grace his shelves. Not even a pill except of his own manufacture. Not a sugar-coated, gelatin-coated, or even a compressed pill to be seen upon his shelves, to say nothing of his not being obliged to keep half a dozen makes of each of the above lines. Already we think we hear some one murmuring, "What a paradise for pharmacy!"

The R is written by the physician upon rice paper, and, after being compounded, is twisted up into a little roll and returned with the medicine to the owner, *i. e.*,

the patient; hence, no repetition can be made without the return of the original prescription, which is, no doubt, pleasant to the physician. The scales used are on the principle of the old fashioned steelyard. The pan is usually about four inches in diameter, and the weighing is performed with great rapidity. Nearly all the ingredients of the prescriptions are chipped drugs or herbs, though occasionally some chemicals may be used, iron rust for instance. These are all bruised in the mortar together, and then a tea is made, either by the druggist or the patient, generally the latter.

The great tonic is ginseng. This is very highly prized, and besides being worn as an amulet is of daily use among them. Its chief office seems to be that it "makes strong," which is about all they can or will "savey" on the subject.

Opium is largely sold, but always, we believe, in the state of aqueous extract. This is, of course, almost entirely used for smoking purposes, and is prepared exclusively, we believe, in China and imported in the state of an extract of about the consistence of honey. It comes of two grades, the finest called "first chop," and is retailed for its weight of silver, the "two bit" or "four bit" (fifty cents) pieces being placed in a basket upon one end of the steelyard and being balanced upon the pan by the requisite weight of the extract placed in a horn cup. The second grade is sold at various prices. The smoker knows whether he is being cheated or not by the color it gives on the earthen bowl of the opium pipe. If it burns to a light, rich brown color and gives the peculiar odor so grateful to the olfactory nerves of the Mongolian, it is satisfactory. Good smokers will smoke of an evening the weight of a trade dollar, perhaps more, of the "first chop" extract, but of this we may speak in a future paper.

In closing this paper, a circumstance occurring Sixth mo. 9th, 1878, is brought forcibly to mind. Mr. Wong Ah Get, dying at the hospital of the Ning Yung Cal stated that he died of taking Mar Tin, which, upon investigation was found to be the bean of *Strychnos Nux Vomica*; the Chinese obtain the poison from the floss of the bean, as they use the meat in the preparation of a cathartic. The eminent Chinese physician, Dr. Li Po Tai, said, in his opinion strychnia was a mineral poison obtained from the ground, and that there was no antidote for it. This seems to be illustrative of the amount of pharmaceutical and medical knowledge on the subject.

Philadelphia.

AMERICAN PHARMACEUTICAL ASSOCIATION.

First Session.—The twenty-sixth annual meeting assembled in Concordia Hall, in the city of Atlanta, on Tuesday, November 26, at 3 o'clock P.M. President Saunders occupied the chair, J. M. Maisch acted as secretary. Hon. Mr. Angier, Mayor of Atlanta, was present and delivered an address of welcome, to which Mr. Saunders replied, on behalf of the Association. Messrs. G. J. Lubn, of South Carolina, I. T. Whiting, of Massachusetts, and G. S. Russell, of New Hampshire, were appointed a Committee to Examine Credentials, and subsequently reported that such had been received from the Colleges of Pharmacy of Ontario, Massachusetts,

New York, Philadelphia, Washington (National), Cincinnati, Chicago, St. Louis and Louisville; from the Alumni Associations of Massachusetts, Philadelphia and St. Louis; from the State Pharmaceutical Associations of Connecticut, New Hampshire, Pennsylvania, South Carolina, Georgia and Kentucky; from the Pharmaceutical Associations of Kings county, N. Y., Newark, N. J., Richmond, Va., Augusta, Ga., and from the Literary and Scientific Society of the German apothecaries of New York.

The president's annual address was listened to with marked attention. In it he traced the progress of pharmacy from ancient times down to the present day, compared the manner of conducting business during the last century with that of the present age, and dwelled at some length on the additions to materia medica from the western hemisphere.

Invitations were received from Prof. Geo. Little to visit the rooms of the Geological Survey of Georgia; from the faculty of the Atlanta Medical College to visit that institution; from the Atlanta City Brewing Co. to visit their establishment, and from the druggists of Atlanta to a complimentary dinner, on Wednesday. Invitations were extended to the Governor, members of the Legislature and judges of the Supreme Court of Georgia, to the mayor and to the medical profession of Atlanta, to attend the sessions.

In the absence of the members of the Committee on Papers and Queries, Mr. W. A. Taylor, of Atlanta, was requested to act in their stead, until the election of another committee.

When the roll was called 48 members answered to their names, and subsequently 49 members were elected. The various committees handed in their reports, with the exception of that on metric weights and measures, which was not received.

On appointing the Nominating Committee, it was found that no representatives were present from the following bodies, from whom credentials had been received: The National (Washington), Cincinnati and Chicago Colleges of Pharmacy, the Alumni Association of the Massachusetts College, and the Newark and Richmond Pharmaceutical Associations. The other delegations appointed each one of their number, and the following were added from the association at large: Messrs. P. C. Candidus, of Alabama; A. A. Menard, of Georgia; G. W. Sloan, of Indiana; J. U. Lloyd, of Ohio, and H. E. Griffith, of New York.

The report of the Executive Committee, which was read by the chairman, gave an account of the work performed during the year, related the action taken with regard to the postponement of the meeting, and closed with obituary notices of members deceased during the year. After the reading of the Secretary's report, the Association then adjourned to 9 30 o'clock on Wednesday morning.

Second Session.—At this session the nominating committee presented their report, and the following officers were duly elected to serve for the ensuing year: President, Gust. J. Luhn, of Charleston, S. C.; Vice Presidents, Fred. T. Whiting, of Great Barrington, Mass., Henry J. Rose, of Toronto, Canada, and Wm H. Crawford, of St. Louis, Mo; Treasurer, Chas. A. Tufts, of Dover, N. H; Secretary, John M. Maisch, of Philadelphia, Pa.; Reporter on Progress of Pharmacy,

C. Lewis Diehl, of Louisville, Ky. The standing committees (Executive, on Drug Market, on Papers and Queries, on Business, on Prize Essays and on Legislation) were likewise elected. The President and Vice Presidents present were introduced to the meeting, and on taking the chair Mr. Luhn expressed his thanks for the honor conferred upon him, and promised to use his best endeavors to advance the cause and increase the membership of the Association.

The Treasurer read his annual report, accounting for receipts during the past year amounting to \$5,313.49, the disbursements being \$4,451.18, leaving a balance of \$862.31 in his hands. The report was referred to an auditing committee, consisting of Messrs. J. L. Lemberger, of Pa., B. F. Morse, of S. C., and G. W. Sloan, of Ind.

The following annual reports were read and referred: Of the Committees on Drug Market, on Prize Essays, on Legislation and the report on the Progress of Pharmacy. Mr. Kennedy reported on the Centennial fund that the committee had collected only \$163, but that the Secretary of the local committee had informed him that the time in which to make up the whole amount of \$525 would be extended for another year.

The Association then proceeded to examine the specimens on exhibition, and adjourned afterward until 2.30 o'clock.

Third Session.—After the reading and approval of the minutes, Mr. Kennedy read the report of the Executive Committee in relation to the proposed discontinuance of the exhibitions in connection with the annual meetings. The report was in favor of continuing the exhibitions, but proposed some regulations with the view of excluding objectionable articles, and to embody these regulations in the By-Laws. The report was accepted and the consideration postponed to the next session, when they were adopted. These regulations invite manufacturers and others to exhibit crude drugs, chemicals, pharmaceutical preparations, chemical and pharmaceutical apparatus and utensils, and objects of general scientific and special pharmaceutical interest. The following articles will not be admitted: Proprietary and patented medicines, medicinal or pharmaceutical preparations the names of which have been copyrighted or the complete working formula of which is withheld, and such chemical preparations or mixtures which are offered under other than scientifically recognized names. The report on the exhibition shall include such comments as in the judgment of the committee may be deemed proper.

The report of Mr. Chas. Rice, chairman of the Committee on the Revision of the Pharmacopœia, was read and referred, and resolutions of thanks were passed to the Hon. Wm. M. Evarts, Secretary of State of the United States, to the diplomatic officers of the United States, and to all those gentlemen who have extended aid to the committee. The resignation of Mr. Rice as chairman of the committee, tendered on account of impaired health, was accepted with regret.

Mr. Kennedy read a paper on pharmaceutical preparations of coca, suggesting a *fluid extract of coca* to be prepared from the powdered leaves by exhausting them with a mixture of three measures of strong alcohol and one measure of water; also an *elixir of coca* made by percolating 4 troyounces of powdered coca leaves with 70

per cent. alcohol until 12 fluidounces of tincture are obtained, dissolving in this 6 drops of oil of orange and 2 drops of oil of cinnamon, and adding 4 fluidounces of syrup.

A very comprehensive paper on *Erythroxylon coca*, by James G. Steele, was also read. Mr. Steele reduces the leaves to powder by grinding them with one-third their weight of sugar; the powder is exhausted with a mixture of equal measures of strong alcohol and water, the fluid extract being obtained by expressing strongly at least twice, no heat being employed. If bicarbonate of potassium had been added during the process, the taste of the fluid extract was less agreeable and the effects were less convincing than with the hydro-alcoholic fluid extract.

Mr. H. J. Rose, however, stated that he had obtained very favorable results with a fluid extract of coca in the preparation of which a small quantity of syrup of lime had been used.

Query 5, on the *affinity of glycerin for water* was continued to Mr. Kennedy at his request; his experiments are not yet concluded, but thus far have proved that glycerin, when exposed to a damp atmosphere, absorbs much larger quantities of water than is generally supposed.

Query 7 was answered verbally by Dr. Menninger. The *damiana* originally introduced is a species of *Turnera*; another variety is a species of *Haplopappus*. Neither the one nor the other possesses the aphrodisiac properties for which the drug has been lauded.

Mr. S. A. D. Sheppard's paper on *compound resin cerate* suggested the substitution of the linseed oil by an equal quantity of paraffin oil, for preventing the preparation from becoming tough. Expressed oil of almonds will likewise obviate the difficulty, but it is less desirable than paraffin oil.

Prof. Sharples, in answer to query 10, reported a considerable number of poisonous or injurious substances used for *coloring candies*, among which may be mentioned gamboge, chromate and other compounds of lead, compounds of copper, arsenic, antimony, cadmium, etc.

A very interesting paper on the *berries of Benzoin odoriferum*, by Dr. A. W. Miller, was read and samples of the products exhibited. By warm expression and by subsequent treatment of the press cake with gasolin, the author obtained 50 per cent. of fixed oil, having the consistence of castor oil, and a greenish brown color. The berries were found to contain about 1 per cent. of a thin bright green volatile oil, having the specific gravity .850, and resembling in taste that of allspice and prickly ash; it appears to possess carminative properties.

Query 17 was answered in a paper by E. L. Boerner, who recommends, in preparing *fluid extract of colchicum seed* to deprive the powdered seeds of fixed oils by treatment with gasolin, which is preferable for this purpose to ether, the latter solvent dissolving also notable quantities of colchicia. The advantages of this treatment are, that the preparation is free from fixed oils; hence is more elegant in appearance, mixes with aqueous liquids without causing turbidity, and may perhaps be useful for hypodermic medication, if the glycerin be omitted.

Mr. Shinn reported verbally on *fluid extract of wild cherry* and exhibited various samples. The treatment of the powdered bark with a mixture of glycerin and

water is considered to yield a better preparation than the process of the pharmacopœia.

On motion of Dr. Menninger a committee, consisting of Messrs. Lemberger, of Pa., Ingalls, of Ga., and Drake, of Mo., was appointed to draft resolutions expressive of the sense of the meeting relative to the recent death of Mr. Thos. H. Powers.

A letter from Messrs. Wallace Bros. was read, inviting the members to visit Statesville, N. C., and the invitation was accepted. The Association then adjourned until Thursday morning at 9.30.

Fourth Session.—After the reading of the minutes, an invitation from Mr. Wm. J. Land, State Chemist, to visit his laboratory, was received and accepted. Invitations were also received from Portland (Me.), Indianapolis (Ind.) and Cincinnati (O.), to hold the next annual meeting in the cities named. On motion, a committee consisting of Messrs. Eastman of New Hampshire, Tarrant of Georgia and Tomfohrde of Missouri was appointed to consider and report on the time and place of the next annual meeting.

Dr. Murray introduced several resolutions, urging some measures with the view of simplifying the popular introduction of the metric system of weights and measures, namely, to memorialize Congress praying to authorize the Chief of the Signal Service to add to the meteorological table a column giving the temperature in the centigrade scale; and to authorize the Director of the Mints to stamp the different gold, silver, nickel and copper coins with their respective weights in grams and centigrams. The resolutions were referred to the Executive Committee, to report thereon at their convenience.

The report of the Committee on Ways and Means was read, accepted and laid upon the table for future action.

A paper by Prof. Remington in answer to Query 18, on *fluid extract of liquorice root*, was read and referred for publication. The formula proposes to exhaust 16 troyounces of powdered liquorice root with a mixture of 4 fluidounces of alcohol, 3 of glycerin, 8 of water and 1 of stronger water of ammonia; the percolation is continued with alcohol diluted with 3 times its bulk of water until 24 fluidounces are obtained, the first 12 of which are reserved and the remainder evaporated to 4 fluidounces and then mixed with the reserved portion. Prepared in this way, six cubic centimeters of the fluid extract, when treated with a slight excess of diluted sulphuric acid, yielded a precipitate of glycyrrhizin, which after washing and drying weighed 0.967 gram, or a larger quantity than from five other fluid extracts, made by different processes. *Syrupus glycyrrhizæ* may be made by mixing 2 fluidounces of this fluid extract with 14 fluidounces of simple syrup. *Elixir glycyrrhizæ aromaticus* may be obtained by mixing 2 fluidounces of the fluid extract, 4 of alcohol, 6 of syrup, 10 minims of oil of cloves, 5 minims of oil of cinnamon, 12 minims of oil of nutmeg and sufficient water to make one pint.

Mr. Lloyd read a very interesting paper on the *preparation of salts of berberina* in

answer to Query 26, and illustrated the subject by numerous samples of the products in various stages of manufacture. The paper is not adapted for condensation; but we hope to be enabled to publish it in full.

The report of the Committee on the Next Annual Meeting was read by Mr. Eastman; it proposed to meet next year in Indianapolis, on the second Tuesday in June. After some discussion the report was adopted with the amendment that the meeting be held on the second Tuesday of September.

Mr. Lloyd exhibited a number of samples of *resin of podophyllum*, and read a paper on the same subject in answer to Query 27. It conveys the information that a very light-colored resin may be obtained by precipitating the tincture with pure cold water and drying the precipitate in the cold. A solution of alum added to the water imparts a greenish-yellow color to the resin; the use of heat during precipitation and drying darkens the color, and with common water different shades of color are obtained, according to the saline matter dissolved in the water.

A paper by J. L. Lemberger, in answer to query 29, on a *liquid preparation of lactucarium*, and illustrated by various specimens, was read. It proposes a *fluid extract of lactucarium*, to be made by beating 16 troyounces of lactucarium, depriving it of caoutchouc and lactucerin, by treatment with 32 fluidounces of petroleum benzin, after drying, powdering it with an equal bulk of sand, and exhausting it in a percolator with diluted alcohol. The first four fluidounces are reserved; the remainder is distilled and evaporated to 10 fluidounces, filtered, and the filter washed with sufficient diluted alcohol to make the whole fluid extract weigh 16 troyounces. By mixing one troyounce of this fluid extract with sufficient diluted alcohol to make 8 fluidounces, *tincture of lactucarium* is obtained, and on mixing the same quantity with sufficient simple syrup for 16 fluidounces, a nearly transparent *syrup of lactucarium* may be made, having all the bitter taste of the official syrup.

Mr. Lloyd read a paper in answer to query 43, on *tinctures prepared with fresh plants*. The author's experience is in favor of tincturing plants containing essential oils while fresh. Other plants may be partially dried, but complete drying previous to exhausting them appears to dissociate some of the active principles. A tincture prepared from undried *veratrum viride* was found to be an inferior preparation, but when the root was recently dried, the tincture prepared from it had the proper effects.

A paper by Prof. Sharpley, in answer to query 48, on *distinguishing the cinchona alkaloids*, elicited some discussion, it being maintained that from the recently precipitated alkaloids, even in the presence of a large excess of cinchonia, all the quinia and quinidia may be readily extracted by ether, together with cinchonidia and some cinchonia, and that the undissolved portion does not show the thalleioquin reaction with chlorine water and ammonia.

An adjournment was had until 2.30 P.M.

Fifth Session.—An invitation from the Committee on Arrangements to attend a concert and social entertainment on the same evening was received and accepted.

A paper by Mr. J. R. Mercein, on *chemicals manufactured by apothecaries*, was read in answer to query 52. The author advocates the more general preparation of many chemicals by the pharmacist, and enumerates a number, which may readily be made with very simple apparatus, such as are found in every pharmaceutical store.

Dr. Murray read a paper on *uniformity in chemical terminology*, urging the general adoption of certain terminations in designating elements and compounds of different classes.

Mr. Saunders exhibited many samples of *sachet powders*, and read a paper on this subject, in which he recommended their preparation by the following formulas;

Heliotrope.

Rose leaves,	two ounces.
Orris root,	one ounce.
Lavender flowers,	one ounce.
Tonqua leaves,	two drachms.
Benzoin,	one drachm.
Musk,	five grains.
Oil of bitter almonds,	three drops.
Oil of santal,	thirty drops.
Oil of neroli,	ten drops.

Clovepink.

Orris root,	two ounces.
Lavender flowers,	one ounce.
Patchouly leaves,	half ounce.
Cloves,	two drachms.
Deertongue,	two drachms.
Pimento,	one drachm.
Musk,	two grains.
Oil of rose,	ten drops.
Oil of neroli,	twelve drops.
Oil of santal,	twenty drops.
Oil of lavender (Engl.),	ten drops.

Mille Fleurs.

Lavender flowers,	six drachms.
Cloves,	two drachms.
Cassia buds,	two drachms.
Coriander,	half ounce.
Benzoin,	half a drachm.
Nutmeg,	half a drachm.
Vanilla,	one drachm.
Orris root,	two ounces.
Musk,	five grains.
Oil of rose,	five drops.
Oil of neroli,	four drops.
Oil of patchouly,	two drops.
Oil of lavender (Engl.),	four drops.
Oil of verbena,	two drops.
Oil of santal,	ten drops.

Jockey Club.

Lavender flowers,	half ounce.
Rose leaves,	one and a half oz.
Orris root,	two ounces.
Vanilla bean,	half a drachm.
Musk,	four grains.
Extract of jasmin,	two drachms.
Oil of santal,	twenty drops.
Oil of neroli,	five drops.
Oil of rose,	ten drops.

Frangipanni.

Orris root,	two ounces.
Rose leaves,	two ounces.
Vanilla bean,	one drachm.
Benzoin,	one drachm.
Oil of lavender (Engl.),	fifteen drops.
Oil of bergamot,	sixteen drops.
Oil of cassia,	six drops.
Oil of pimento,	ten drops.
Oil of santal,	thirty drops.
Oil of neroli,	sixteen drops.
Oil of rose,	eight drops.

Wild Flowers.

Asarum canadense,	one ounce.
Deer tongue,	half ounce.
Lavender flowers,	half ounce.
Sweet flag root,	one drachm.
Coriander,	six drachms.
Patchouly leaves,	one ounce.
Nutmeg,	one drachm.
Oil of bergamot,	forty drops.
Oil of neroli,	ten drops.
Oil of santal,	twenty drops.
Oil of verbena,	five drops.
Oil of patchouly,	five drops.
Extract of jasmin,	two drachms.

Mr. Maisch exhibited a sample of *the volatile oil of asarum canadense*, and stated that Messrs. A. H. Van Gorder and Emil Boerner considered it to be an ingredient

of "Hoyt's German Cologne," and that the last-named gentleman had used it not only in perfumery, but likewise in medicine, in the form of medicated water and of syrup, the latter prepared by dissolving sugar in the asarum water.

Mr. J. U. Lloyd read a paper entitled *miscellaneous notes*. In 1875 he had reported on *dilute hydrocyanic acid*, prepared with alcohol in August, 1872; of 112 one ounce vials of this acid, the contents of two have become black, and in both the acid has been in contact with organic matter, the stoppers having been waxed. Another lot made in July, 1874, has been kept in a one-gallon bottle, which was opened from time to time, acid being withdrawn until only a few ounces remain, which are colorless, and contain 1.43 per cent. HCy, the strength having decreased about one-fourth.

A sample of *Tincture of geranium maculatum* was made in March with alcohol of spec. grav. .835, and was found gelatinized in June, having at the same time acquired a faint odor of wintergreen. A sample of *fluid extract of stillingia*, which had been converted into a jelly-like mass, was likewise shown. The causes of these changes are not known.

Mr. Lloyd also exhibited a specimen of the *bark of mangifera indica*, which has been recommended and used to some extent in this country in diarrhoea and diseases of the mucous surfaces.

Attention was also called by Mr. Lloyd to some California plants which had been introduced under fictitious names, one having been called *yerba reuma* was found to be *Frankenia grandifolia*, nat. ord. Frankeniaceæ, a common plant of California, having a very salty taste. The article introduced under the name of *casara sagrado* was ascertained to be the bark of *Rhamnus Purshiana*. The *mountain or Oregon grape* of the Pacific coast is usually referred to as *Berberis aquifolium*, but Mr. Lloyd has found *B. repens*, *B. nervosa* and *B. pinnata* substituted for it.¹

In commenting on Mr. Lloyd's paper, Messrs. Maisch and Saunders referred to censurable practices which had become rather frequent of late years and should be discountenanced—such as the introduction under fictitious names of drugs and chemical preparations and the copyrighting of names for preparations intended for medicinal use.

The Auditing Committee reported having found the accounts of the Treasurer correct, and proposed that this officer should be required to preserve his vouchers for the space of three years, after which time they may be destroyed. The motion was carried.

Mr. Lemberger read a paper by J. F. Hancock on *the arrangement of store room and cellar* in answer to query 56.

Mr. Saunders read a paper by Dr. E. R. Squibb, entitled *fluid extracts by repercolation*, which gives in tabular form the results of a large number of observations on all the fluid extracts in common use, and completes the paper of the same author published on page 209 of the "Amer Jour. Phar.," 1878. On motion the Association voted that both papers be published in the Proceedings. Prof. Diehl's paper on the same subject was likewise referred for publication.

¹ Most of the samples received by us were *B. nervosa*. All these species appear to contain berberina, and probably possess alike properties.—EDITOR.

Mr. Eli Lilly, of Indianapolis, was nominated and duly elected local secretary.

The Committee on the President's address and Secretary's report reported a series of resolutions which were adopted, expressing the thanks of the Association to the publishers of "New Remedies" and of the "American Journal of Pharmacy" for their courtesy in loaning wood cuts for the volume of Proceedings, and to Mr. G. J. Carney, of Lowell, Mass., for defraying one-half of the expenses of the portrait of his brother. The delegates present, as well as those who may be accredited to future meetings, were requested to hand to the secretary the names and address of the president and secretary of the Association represented by them for publication in the Proceedings.

On motion of Mr. Saunders it was resolved that when the Association again meets in the Southern States the meeting should take place during the spring months.

The Business Committee presented several valuable papers by Prof. A. B. Prescott, which had been prepared for the use of the Pharmacopœia Committee, and are entitled *Morphiometric process for opium*, *Valuation of tincture of opium*, *Separation and quantitative estimation of the cinchona alkaloids*, and *Purification of strychnia from brucia*. The papers were referred for publication.

The propositions of the Committee on Ways and Means were called up for consideration as amendments to the by-laws, but after some discussion the members were evidently not prepared to vote thereon, and the proposed amendments were ordered to be printed and made the special order of business for the third session of the 27th annual meeting. The committee favors the accumulation of a permanent fund from fees which may be received from life memberships, and proposes a graded fee for those who may have paid their annual contributions for five years or more. The committee further proposes that at each annual meeting, if necessary, a per-capita tax shall be levied and collected to cover estimated deficiencies, as may be determined by the Auditing Committee. Life members shall be furnished with the Proceedings upon application to the Secretary.

The Association then adjourned until Friday morning at 9 o'clock.

Sixth Session.—A large number of fluid extracts were exhibited illustrative of the results detailed in Prof. Diehl's paper. A paper on percolation, written by Mr. E. A. Joy, was referred to the Pharmacopœia Committee. In view of the inability of several members of this committee to participate actively in the work of revising the Pharmacopœia, on motion of the Business Committee, Messrs. E. H. Sargent, J. U. Lloyd and L. Dohme were appointed in place of Messrs. Ebert, Wayne and Hancock; and Mr. Dohme was appointed chairman in place of Mr. Rice, resigned. Mr. Lloyd desired to decline, but was prevailed upon to accept the appointment.

Mr. Lemberger, on behalf of the committee appointed for the purpose, submitted the following resolutions, which were adopted:

WHEREAS, This Association has been apprised of the decease of Mr. Thomas H. Powers, late of the city of Philadelphia, Pa., who, although not a member of this body, has become endeared to us, and his memory deserves a suitable tribute at our hands, and whilst we bow with submission to the Divine decree, we nevertheless feel a painful sadness in the thought that one whose lifelong devotion to the

study and development of the science of chemistry and pharmacy in our country has been removed, whose character was unalloyed with blemish, whose fame as a man of strictest integrity and honorable purpose, whether received from a commercial or social standpoint, has spread far and wide, whose kindness of heart knew no bounds so long as he was cognizant of its demand, and whose every act was prompted by a conscientious duty, we feel that in his death we are bereft of his useful influence and much-valued encouragement in all that appertains to the highest interests of our Association. Therefore

Resolved, That this Association has an unfeigned, though a melancholy, satisfaction in testifying its mark of appreciation of his service as a sincere humanitarian, a friend of education and an unexceptional example for us all—a shining mark among the illustrious and useful men of this age, whose exemplary life is worthy of highest admiration, and in whose footsteps we may with safety be emulated to follow.

Resolved, That, as an association representing large commercial enterprises and interests, we find embodied in the life of the deceased those elements of virtue and purity of character to which we are proud to point as typical of all that constitutes the highest order of business integrity.

Resolved, That the sympathy of this Association is mingled with that of the numerous beneficiaries of the deceased, and by this tribute is hereby tendered to the surviving afflicted family and firm of which he was a much-revered member, trusting that the affliction thus visited upon them will be followed by the comfort that a recollection of a life so usefully spent is more honorable and enduring than any other monument or tribute that can possibly be raised to his memory.

Resolved, That a copy of this memorial expression be forwarded to the family and firm of the departed.

The following resolution was offered by Mr. Saunders and passed:

Resolved, That the heroism of our fellow-pharmacists in the plague-stricken districts in the valley of the Mississippi, who have nobly stood at their posts in the hour of danger, is worthy of commendation, and this Association desires to place on record at this time its admiration of their noble doings in thus aiding suffering humanity at the risk of their own lives.

The sum of ten dollars was appropriated to cover deficiencies in the expenses of the Pharmacopœia Committee for the past year; and \$25 were appropriated to the same committee for the ensuing year.

Nine new members were duly elected.

Mr. Maisch exhibited a section of the stem of cork oak, a piece of the bark and a sample of tea, all grown in Georgia and handed in by Mr. Ingalls; also specimens of saffron adulterated with a white powder (gypsum?), and saffron cultivated in Lebanon county, Pa., handed in by Mr. Lemberger.

Resolutions were passed thanking the Committee of Arrangements, the druggists and citizens of Atlanta, for their kindness and attention; the "Constitution" (daily paper) and its reporter for publishing the proceedings, and the officers for services rendered.

The Committee on Exhibition made a report, and were granted time for finishing it.

At 11 o'clock the Association adjourned, to meet again at Indianapolis, Ind., on the second Tuesday of September, at 3 o'clock P.M.

MINUTES OF THE COLLEGE.

PHILADELPHIA, November 22d, 1878.

A special meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, to take such action as might be deemed appropriate concerning the death of our late respected fellow-member, THOMAS H. POWERS.

The meeting was called to order by the President, who, on taking the chair, made a few remarks appropriate to the sad occasion. He informed the meeting that he had known Mr. Powers intimately for fifty years, commencing at the time when he was just entering his business career. During all this time their relations had been of the most cordial character, and his testimony of his deceased friend was that his course through life should be held up as an example to be followed by all. His whole life had been characterized in a pre-eminent degree by integrity, practical philanthropy and devotion to Christian principle.

The meeting was largely attended, some of the older members, who had been his contemporaries in early life, being present to take part in the proceedings.

On motion of Thomas S. Wiegand a committee, consisting of Sam'l F. Troth, Charles Bullock and Joseph P. Remington, was appointed to draft resolutions expressive of the sense of the meeting, and report the same before the close.

A letter from Frederick Brown was read, expressing his regret at the loss sustained, and of his inability to be present and take part in the proceedings.

Addresses were made by Samuel F. Troth, John C. Allen, Jos C. Turnpenny, Ambrose Smith, Charles Bullock, Daniel S. Jones, Thomas S. Wiegand, Joseph P. Remington, Andrew Blair, E. M. Boring and others. The older members narrated their early experience with the deceased, and bore uniform testimony to the excellence of character developed in his youth, and which continued to strengthen and increase during his whole life.

The testimony of all who spoke was that his whole life had been devoted to doing good to others; that his charities were not confined to those persons whom he alone knew, but were unobtrusively distributed wherever worthy want was made known to him; that he carried his religious duties so far as to make them a part of his business life, so that right and justice should be meted out to all with whom he came in contact; that he was faithful, benevolent, kind and considerate to all those who were in his employ, and that these principles were fully carried out to the end of his life; that religious and charitable associations with which he was connected will deplore his death, and that this College, for the friendship manifested towards it by him, will ever hold his memory in grateful remembrance.

It was the universal sentiment expressed by everyone who spoke that all who knew him or came in contact with him in the various avocations of life, held him in the highest esteem.

Joseph P. Remington, on behalf of the committee, read the following preamble and resolutions, which were, on motion, unanimously adopted:

WHEREAS, The Philadelphia College of Pharmacy has learned with sincere sorrow of the death, on the 20th inst., of our honored fellow-member, THOMAS H. POWERS; and, as it is meet that we should express our sense of the loss we have sustained, therefore

Resolved, That in the decease of THOMAS H. POWERS this College has lost a member who, by his personal services and substantial liberality, has greatly aided in its growth and prosperity.

Resolved, That, as fellow-members of the College, we desire to express the high esteem in which we held the character of our deceased friend.

Resolved, That we desire to express our high appreciation of the noble example that he has left us of a large-hearted liberality, which knew no bounds when called upon for worthy objects, of his unflinching integrity, and of his skill in matters which related to business, and his devotion to the best interests of our profession.

Resolved, That the members of the College convene at the Hall, and proceed to the funeral in a body.

Resolved, That these resolutions be engrossed and sent to the family of the deceased, as an expression of our sympathy for them in their bereavement.

An unfinished memoir was read by Charles Bullock, Chairman of the Committee on Deceased Members, which was approved, and referred back to the committee for completion and publication in the "Journal of Pharmacy."

The business for which this meeting had been convened having been solemnly concluded, then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 19th, 1878.

The meeting was called to order, and Mr. Alonzo Robbins was requested to act as chairman. The minutes of the last meeting were read and approved.

As announced in the notices, the collection of Japanese drugs was exhibited; these numbered in all some 225 specimens, were put up in four ounce wide-mouthed bottles, and labeled with Japanese inscriptions as well as with their scientific appellations.

A series of essential oils made by Pollak & Co., of Vienna, which were displayed at the late Centennial Exhibition and presented to the College, were also examined and called forth much commendation.

Prof. Sadtler exhibited a sample of oil of turpentine brought from San Francisco, said to be derived from the sugar pine, *Pinus ponderosa*. It is claimed by some to be superior to ordinary oil of turpentine in not being liable to resinify upon exposure, but the sample disproved this statement.

Mr. Boring called attention to a sample of oil that had been purified by treating it in a patented apparatus which it is claimed will restore even rancid oils to their original sweetness. The apparatus was described as a jacketed churn into which cold air was forced by steam power, the temperature being kept at about 100° F.; as it was recommended in connection with codliver oil, almost all the members who

participated in the discussion thought it was unwise to dispense such oil as had undergone any process by which its remedial powers could be in any wise impaired.

Prof. Maisch, on behalf of Mr. Garcia, a student of the present class from Cuba, presented a pod of *Theobroma cacao*, and also one of *Cassia brasiliana*. This last tree, a native of Brazil, has been introduced into the West Indies and grows there luxuriantly; the pod is thicker in diameter and longer and yields a greater quantity of pulp but not quite so sweet tasted as the *Cassia fistula*, for which it is sometimes substituted.

Prof. Maisch also exhibited a specimen of the *Phrysenoma cornuta* or horned toad, which had been sent from Texas by mail; it was a curiosity to most present and is singular in being able to exist for a long time without food; this individual had been without food for several days before starting on his travels and two or three days after his arrival here he escaped from his cage, a paper box, and has been wandering through the various rooms in the college for a week or two, still shows signs of vitality when so inclined.

Phenol phtalein has been mentioned as a test for alkalis by Mr. Drew of Brooklyn, and its delicacy was shown to be such that a single drop of alkali when added to a dilute neutral solution gives a distinct red coloration.

Prof. Maisch presented a photograph of the inflorescence of *Calla æthiopica*, which exhibited partial transformation of the spathe into a leaf.

Samples of benzoinated and carbolized solution of alumina were sent by Mr. H. G. Debrunner, of Pittsburg, and a paper was read giving the process for preparing it (see page 572). On motion a vote of thanks was tendered to Mr. Debrunner.

As a matter of interest to the members present, Prof. Maisch stated the number of the present class to be about 166 in both junior and senior courses.

There being no further business, on motion the meeting adjourned.

THOMAS S. WIEGAND, Registrar.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

New York College of Pharmacy.—The conversational discourse on the evening of November 21st commenced with the reading of a paper by Mr. D. C. Robbins, on *Quinia in Commerce*. A history was given of quinia since 1820, with the market variations as affected by the principal intervening circumstances, as the attempt of the Peruvian government, prior to 1850, to monopolize the sale of bark, and the tariff variations since 1832, when this article made its first appearance in the Customs List of the country, it having been classed previous to this date as an unenumerated article under 5 per cent revenue duty. A list of all the various duties on bark and quinia since 1832 was given, and the opinion was expressed that our present duties on all the products of cinchona bark, as 20 per cent. on sulphate and 45 per cent. on other salts of quinia, taking into consideration the demand for quinia, was objectionable.

A statement of the process and the requirements for the manufacture of quinia was given, to show that our inability to cope with Europe was due to the fact that our navigation laws, by discriminating duties, made the European market the best resort for the crude article. Besides, it was evident that other nations were in advance in the science of the cinchonas—quinology. The ruling quotations for quinia in Europe appeared to prove that this knowledge is farthest in advance in Germany, next in France and in England.

The lecturer believed that the determination of the value of the bark, which was a very difficult matter, was as well understood in the United States as in any country, and that there was little doubt that our machinery and devices to save labor and expense were in advance of other nations. A wise conservative tariff policy was advised, and that all duties upon these very important medicaments be reduced to 10 per cent. *ad valorem*.

The discussion upon *Quinia in Pharmacy* was a very important one, and participated in by Mr. Charles Rice and others. Tables were exhibited to show the solubility in ether of all the quinias of commerce, fifteen in number, as also of the extent to which many varieties of quinia could be combined with cinchonidia and make a clear solution, U. S. P.

A table of densities of the various quinias was also exhibited, by which it appeared that an organic change took place in the crystallization of the salt, as the bulk of some varieties, when finely powdered, was double that of others, and this last fact, which had never been noticed in our journals, had a very important bearing upon excipients and pill masses.

Alumni Association of the Philadelphia College of Pharmacy.—The Second Social Meeting of this season was held at the College, November 7th, with an attendance of fifty-five. In the absence of the president, vice president Procter took the chair. After the reading of the minutes of the last meeting, Mr. Cook read an elaborate essay on the nat. order Compositæ. Mr. Sayre exhibited a few leaves of a California plant commonly called there wild peach, a popular remedy in that State for rheumatism. A student stated that it grew in Texas, and promised to procure a specimen of both the fruit and leaf for a future meeting.

Mr. Mattison recognized it as what is sold here as yerba santa. A very interesting paper was then read by Mr. Mattison on Chinese pharmacy in the United States.

Dr. Murray read a paper entitled "How to take notes," which contained some useful hints to students.

Mr. Kennedy spoke of the practice in some stores of adulterating cold cream, and mentioned one case that came to his knowledge where the druggist was in the habit of dispensing simple cerate, scented with oil of bergamot, as cold cream. He then read an essay on Ung. Aquæ Rosæ. He spoke also of the substitution of water for alcohol in tinct. ferri chlor. being practised in some country drug stores, and strongly condemned the custom.

Dr. Murray spoke in the same strain, and predicted that so soon as pharmacists should adopt this plan tincture of iron would share the fate of dialyzed iron, as the

tincture depends for its virtues largely on the alcohol and chloric ether it contains. This led to a discussion on the subject of chloric ether, during which different views were expressed. Mr. Procter submitted ten specimens of official tinctures, and Mr. Jones six samples of crude drugs for examination and recognition by the students, in which they were fairly successful.

Mr. Jones submitted a sample of compound spirit of juniper, made by Mr. J. B. Moore by a formula devised and recommended by him. The formula is as follows:

Oil of juniper,	3ivss
“ caraway,	
“ fennel,	āā m℥x
Alcohol,	
Boiling water,	āā Oi
Diluted alcohol,	q.s. ut fit Oii
Magnesium carbonate,	3x

This gives a clear starbright preparation considerably stronger than the present official one. On motion adjourned.

Austrian Apothecaries' Association.—The general meeting was held on Monday, October 14, 1878, at Vienna, Director Schiffner in the chair. Secretary Kwisda and Treasurer Seipel read their annual reports. A committee to inquire into the affairs of the Association was then appointed. Dr. Godeffroy spoke of the pharmaceutical preparations at the Paris World's Exhibition, exhibiting at the same time new pharmaceutical articles, presented to the Museum of the Association. The lecturer also demonstrated Edison's electric pen and phonograph.

Berlin Apothecaries' Association.—A meeting was held on Wednesday, Oct. 23d, at 6 P. M. Reports of the different officers of the Association and of the committees were read and approved and official communications discussed.

Mr. Hoffmann delivered a lengthy address on the methods for testing chemical and pharmaceutical preparations of the Pharm. Germ.

After a lively discussion on the syrups of the latter, the meeting adjourned.

Hungarian Apothecaries' Society.—The general meeting was held at Budapest, on Wednesday and Thursday, July 24th and 25th, the President, Jarmay, in the chair. The directorial report was read, treating principally of the execution of the resolutions adopted at the former meeting.

Mr. Rozsnyay delivered an address on Polariscopic examinations for distinguishing the cinchona alkaloids, by which he claims to be able to detect all adulterations qualitatively and quantitatively. Mr. Kiss exhibited medicated confections. Mr. Trajanovics delivered an address on animal malformations.

The next general meeting will be held at Budapest at the same time with the meeting of Hungarian physicians and naturalists.

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